a journal for precision engineers and all users of industrial diamonds and other hard materials

INDUSTRIAL DIAMOND REVIEW

incorporating INDUSTRIAL DIAMOND ABSTRACTS

MONTHLY 1/3 SUBSCRIPTION 15/- A YEAR

August, 1961 Vol. 21 No. 249

D. S. I. R.
National Lending Library
for Science and Technology

4450
NATIONAL ENGINEERING LABORATORY
31 AUG 1961
LIBRARY.

AUSTRALIA
BENELUX
BRAZIL
BRITISH GUIANA
CANADA
FRANCE
GREAT BRITAIN
INDIA
ITALY
JAPAN
NEW ZEALAND
SCANDINAVIA
SPAIN
SWITZERLAND

Triefus

INDUSTRIAL DIAMONDS
TRIEFUS & CO. LTD.,
THAVIES INN HOUSE, 4, HOLBORN CIRCUS,
LONDON, E.C.1, ENGLAND
Telephone : FLEet Street 9741 Cables : Triefus, London

DIAMOND PRODUCTS
TRIEFUS INDUSTRIES LTD.,
MANOR ROYAL, CRAWLEY, SUSSEX, ENGLAND
Telephone : Crawley 2244 Cables : Triefus, Crawley
DRILL BITS DIAMOND TOOLS
DIAMOND MICRO-POWDERS

INDUSTRIAL DIAMOND COMPANY (SALES) LTD.

INDUSTRIAL DIAMONDS FOR ALL APPLICATIONS

DIAMOND POWDER

- We offer a 24 hour delivery service
- Our prices are highly competitive and credit facilities are available

ENQUIRIES INVITED

88/90 · HATTON GARDEN · LONDON · E·C·1

Telephone: HOLBORN 2642/2247 *Telegrams:* IDECE, LONDON

The Diamond Tool people

have now moved to our own office block, in the heart of London's diamond industry. This means a better than ever service for you and all your diamond tool and wheel requirements.

Industrial diamonds may look alike, but there is a vast difference between the good and mediocre which only a diamond expert can see. You have to trust your diamond tool supplier because it is on his integrity and experience that your diamond tools depend.

Indusmond is one of a group of companies who have worked in diamonds for as many as ninety years, and have been making diamond tools for twenty years. During this period Indusmond have established a reputation for high quality and perfection that is second to none.

Try Indusmond tools next time—you can trust them!

Wheel Dressing Diamond Tools. Shaped and Polished Diamond Tools. Hardness Diamond Tools. Diamond Impregnated Wheels and Laps. Diamond Impregnated Drills and Saws.

indusmond
DIAMOND TOOLS

Call and see us at Memfagimal House, 26-29 St. Cross Street, Hatton Garden, London, E.C.1.

—you'll be made very welcome.

Telephone : CHAncery 7608

MICROSTRUCTURES OF DIAMOND SURFACES

by S. TOLANSKY, D.Sc., F.R.S.

The original work published in this book cannot be overlooked by anyone concerned with any application of diamond.

Professor Tolansky has applied the powerful new optical techniques that he has developed—amidst world wide acclaim—to the surface of diamond. These techniques make it possible to resolve height and depth features as small as *one twenty-five millionth of an inch* and effective magnifications in depth of half a million times to be made by simple and inexpensive means.

Many facts about diamond are still unknown—the basic laws of growth, for example. The remarkable pictures obtained by Professor Tolansky enable fundamental new deductions to be made regarding the nature of diamond surfaces and therefore of the growth of diamond.

The text is written for the general reader and includes an elementary introduction to the optical techniques that have made such photographs possible.

CONTENTS

The Optical Techniques
Some Characteristics of Diamond
The Topography of the Natural Octahedron Faces
The Nature of the Trigons
Some Growth Features on Octahedron Faces
Linear Discontinuities on Diamonds (Slip ?)
The Etching of Diamond
Diamond Cleavage
Optical Shadow Casting
Percussion (pressure) Marks on Diamond
Polished Diamonds
143 Special Art Plates

NO LIBRARY ON DIAMOND IS COMPLETE WITHOUT THIS ESSENTIAL BOOK

From N.A.G. PRESS LTD., 226, Latymer Court, LONDON W.6 or your bookseller.
Price **40/-**, by post **41/6**

$8.50 in U.S.A. and Canada, Distributed in U.S.A. and Canada by Huebner Publications Inc., 1975 Lee Rd., Cleveland, Ohio

DIAMOND TECHNOLOGY

by Paul Grodzinski

800 pages: 500 illustrations: 94 tables.

CHAPTERS

Chapter 1—Technology of Machining Methods.
Chapter 2—Dividing Diamonds and Gem Stones.
Chapter 3—Bruting.
Chapter 4—General Survey of Grinding and Polishing.
Chapter 5—Grinding and Polishing Gem Stones.
Chapter 6—Grinding and Polishing Diamond.
Chapter 7—Drilling and Boring Holes.
Chapter 8—Carving and Engraving.
Chapter 9—Diamond Powder—Its Production and Use.
Chapter 10—Polishing Gem Stones for Jewellery.
Chapter 11—Manufacture of Watch and Instrument Jewels.
Chapter 12—Manufacture of Diamond and Sintered Carbide Dies.
Chapter 13—Industrial Diamonds, Selection and Orientation.
Chapter 14—Setting Diamonds in Tools.
Chapter 15—Grinding and Lapping Sintered Carbides.
Chapter 16—Production of Piezo-Electric and Optical Crystals. Bibliography. Appendix.

From your Booksellers or the Publishers. Price 52/6d, by post 55/-

N.A.G. PRESS, LTD., 226, LATYMER COURT, LONDON W.6.

$10 in U.S.A. and CANADA, distributed in U.S.A. and CANADA
by Huebner Publications Inc., 1975, Lee Road, Cleveland, Ohio.

Exporters

WOLVERHAMPTON
DIAMOND DIE
& TOOL CO. LTD.

ALL GRADES OF
BOARTS AND INDUSTRIAL DIAMONDS

11 HATTON GARDEN LONDON E.C.1

TELEPHONE HOLBORN 3017 CABLE PARDIMON LONDON

DIAMANT BOART

DIAMOND IMPREGNATED TOOLS
ARE USED ALL OVER THE WORLD

Wheels

Saws

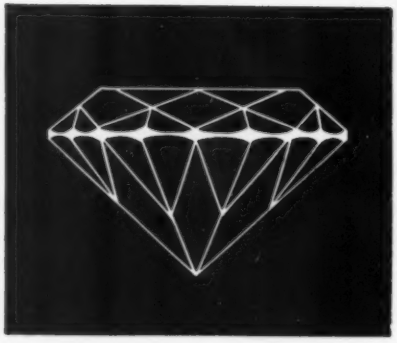
Drill Bits

Truing and dressing tools ∴ Hones Boring Crowns
Dental Tools

74, avenue du Pont de Luttre, Brussels, Belgium

Sole representative in U.K.: **F. Yorke & Partners Ltd, Lassell Street, Greenwich London, S.E.10**

Selected rough diamonds and specially graded diamond powders

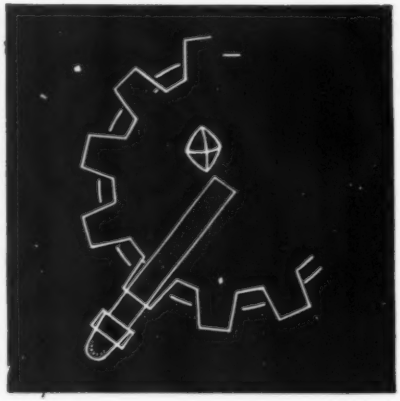


d. drukker & zn. n.v.

specialists in sorting & cleaving

Our new method of diamond sorting will give you new possibilities to get the right materials for the right job.

diamond in art and industry



We present you our private exhibition covering the industrial and the artistic use of diamonds.

If you are interested in our products please visit our works.

amsterdam - holland

12 sarphatikade

phone: 67321

gems - industrials - powder - tools

ask for our new export plan

INDUSTRIAL DIAMOND REVIEW

Vol 21 No 249
August 1961

Editor-in-Chief :
Eric M. Bruton

Managing Editor :
Patrick Greene

★

© 1961 *N.A.G. Press Ltd.— All rights reserved.*

PRINCIPAL CONTENTS

Generally Speaking — **Adamant** — **145**
International Exhibitions in the News — **146**
Transatlantic Trends
Grinding Comes of Age in the US
Morris M. Patterson — **152**
Honing of Heading and Upsetting Dies
G. Haasis — **154**

★

Industrial Diamond Review is published monthly at 1s 3d per copy, and is obtainable through newsagents and booksellers or by postal subscription (15s yearly, post free). Subscriptions in the United States of America are $2.50, and can be entered through the usual subscription agencies or direct through the publishers :—

N.A.G. Press Ltd
226 Latymer Court
London W.6.
(Telephone : RIVerside 2143).

★

Contributions of scientific, technical and practical interest, and news items, are invited, but responsibility cannot be accepted for the safety of MSS, drawings, photographs or other matter submitted. Material not accepted will be returned.

★

All editorial communications should be made to the Managing Editor at
2 Charterhouse Street
London E.C.1
(Telephone : FLEet Street 1577)

Printed by
Martin's Printing Works Ltd., Berwick-upon-Tweed, England

Generally Speaking

Are Diamonds more Popular ?

It has been gratifying to those of us who have been concerned for a number of years with this very specialised business of diamond tooling to notice that the lay press and the less specialised technical press has recently been taking considerably increased interest in industrial diamonds. Admittedly this has partly been due to two circumstances, one of which at least, from our point of view, has been an exceedingly unfortunate one. We refer, of course, to the series of diamond robberies which has taken place in London and other diamond centres over the past eight months or so. The fact that a number of obviously highly skilled thieves found industrial diamonds a suitable subject for the exercise of their skill, undoubtedly attracted the attention of a number of people, who would otherwise have thought of industrial diamonds as one of those things with which the ordinary man had little concern. The other circumstance which has tended to focus some attention on industrial diamonds was the American experiments in deep under-sea drilling in preparation for the project ' Mohole '.

However, it seems clear that these two ' newsy ' items are not entirely responsible for the increased interest in industrial diamonds, which the general Press has recently been showing and some of the effect must, we think, be caused by the greater interest in automated processes, which is being shown generally by anyone interested in the engineering industries. Diamond tools in so many cases are so clearly superior to other materials where long production runs of high precision are necessary, that the interest that follows is almost as automatic as the machinery.

ADAMANT.

International Exhibitions in the News

Reported by Special Correspondents

Moscow 1961

The British Trade Fair held in glorious weather in the Sokolniki Park, Moscow, a former hunting estate of the Russian Tsars, from May 19 until June 4, attracted one and a quarter million eager and inquisitive visitors—specialists and general public and resulted in an as yet uncalculated quantity of business. A wide range of British industry was represented and several firms of interest to readers of our journal had stands there.

In a large glass walled Pavilion D, L. M. Van Moppes & Sons (Diamond Tools) Ltd had a thirty yard long stand at the front of which stood a Diatube machine whose ability to grind through solid paving stones in thirty seconds never failed to impress visitors, both casual and specialist alike. The back wall of the stand was given over to photographic demonstrations of various aspects of diamond tool work. Large photographs of Coventry Cathedral, Tower Bridge and Stonehenge, showed sites at which diamond tools had been employed in construction or reconstruction work. These photographs were surrounded by a row of smaller notices giving details of specific tools and specific uses, *e.g.*, Dianyf, Diadust, chisels, tracers, notices about form grinding, the uses of diamond, the physical properties of diamond and general uses of diamond tools.

The centre of the rear wall was occupied by a three storied, compartmented showcase displaying, at the top, a series of uncut diamonds, in the middle row, some general photographs, and below, a single row of diamond tools—diamond wheel dressers, Diatyst turning and boring tools, honing tools, gear grinders, form grinders, and Diatest gauges.

To the right were more cards with information regarding the varied use of diamond in science, printing, watchmaking, musical instrument manufacture, together with photographs of Diatore, Diatru, Diatust and other machines which use diamond.

Opposite Van Moppes was the stand of Autoflow Engineering Ltd, where two machines using diamonds were being exhibited; one was an automatic 124 Mark 3 Technophot machine for the precision grinding of spherical surfaces and the other—a fully automatic Autoflow Radmaster machine for the production of prescription toric lenses. The latter especially had attracted considerable interest among visitors and delegations. At the present time there are no toric lenses in the Soviet Union. In addition a complete range of diamond wheels were on display which had created a deep impression. In this field too Russian production is low.

Autoflow were well satisfied with the Fair. Their previous customers had been enthusiastic about their purchases and two days before closing all the machines on the stand had been sold or almost sold.

Churchill Machine Tool Co Ltd have already been trading for forty years in the Soviet Union. On their twelve by fifteen yard stand, which was also located in Pavilion D, they were exhibiting three machines, which made use of diamonds. The most general interest was aroused by a Centraliser Grinding Machine which used two diamonds to form materials to any specified shape. In addition, there were on display a Plain Grinding Machine and an Internal Grinding Machine. The latter, an automatic internal and face grinding machine was fitted with two diamonds, one for the face and one for the bore, and this machine had created most interest among the specialist visitors and official delegations. Although at the time of enquiry no orders had been settled, Churchills were notified that future prospects were good.

Coventry Gauge & Tool Co Ltd whose stand adjoined that of Churchill exhibited only one machine using diamond, Gear Grinding Machine No 161 which used shape and form diamonds for thread formation and where the angle of the diamond was always less than the angle of the face produced. Taking all their machines into account, Coventry had already received orders to the total of a million and a quarter roubles for the next two years and signed contracts for considerable orders for 1963.

In general the atmosphere on all the stands by the end of the Fair seemed to be that of exhausted success, actual or potential, and all were glad they had come to Moscow—though glad to be going home !

Interplas 61

From June 21 to July 1 an International Plastics Exhibition, now familiarly known as 'Interplas 61', was held at Olympia, in London. While the greater part of it was devoted to injection and vacuum moulding machines and ancillary equipment, some items held particular interest for readers of IDR.

Engis Limited, a company well known in the diamond tool industry, introduced a new lapping machine for flat surfaces. This new machine, which costs only £85, comprises a rigid cast-iron body 18 in. high by 1½ in. wide and 22 in. long, surmounted by an integrally cast ring to which the lapping jig or work holder is attached. It is driven by a ¼ hp 220/240 v single-phase 50-cycle electric motor running at 1420 rev/minute. The drive is transmitted, through self-aligning couplings and a totally enclosed 20:1 reduction unit, to a vertical spindle which revolves in two self-sealing ball races at 75 rev/minute. This speed ensures the best performance from the lapping plates while enabling the operator to hold the workpiece safely by hand.

Five 8 in. diameter close-grained cast iron plates, which have been hand scraped, then lapped for flatness and surface finished with different grades of Hyprez compound, are used with each machine. These plates can be dropped on to the spindle head and lifted off as required.

Stock removal rates are high, and progressive lapping with the appropriate grades of Hyprez compound obviates the necessity for laborious pre-treatment of the workpiece with abrasive papers before the final surface finish is applied.

The Engis precision flat lapping machine.

To obtain a mirror finish the new self-adhesive Hyprocel polishing disks can be attached to the plates; type PA-K is recommended for use with Hyprez compounds above 1 micron in particle size and PAN-K for compounds of 1 micron or below.

Other products shown by this firm included the Hyplicator (*Industr Diam Rev* 1961 Vol 21 p 32 (Feb)) being shown and demonstrated for the first time at any exhibition; a standard range of Hyprez diamond lapping compounds, the Engis Vonnegut sander head, the rotary abrasive tool used for deflashing plastics, blending contours, removal of machine marks on plastics and general abrading on contoured surfaces without deforming the original shape; abradisc rubber holders and self-adhesive disks in a multiplicity of sizes and grits for the blending of machine marks, grinding and pre-finishing of contours in moulds.

Not all plastics are injection or vacuum moulded to the required shapes; those reinforced with asbestos, cotton, paper or other material are moulded in sheets and rods and than machined to the desired shapes. These materials take the edge off hardened HSS tools in a very short time, so for greater tool economy the manufacturers recommend the use of tungsten carbide tools for any machining operations, as they not only retain their cutting edge much longer but can be used at much higher speeds.

Ferobestos is a reinforced plastic with many applications in industry, and the manufacturers, J. W. Roberts Ltd, of Bolton, have issued a booklet describing the best methods of machining it.

For turning and boring, tungsten carbide bits, with a top rake of 5 deg, side rake of 5-8 deg and front rake of 5 deg, are recommended; cutting speeds, on general work with wide tolerances, can be as high as 700 feet/minute, while for long production runs with fine tolerances and for form tool work, where economy of tool life is necessary, speeds of 400-500 feet/minute and 200-300 feet/minute respectively are obtainable. These speeds are almost 200% higher than those possible with HSS tools. Milling, gear cutting, drilling and reaming to very fine tolerances are all possible with this material, and in all these operations higher speeds are permissible with tungsten carbide tools—showing a saving in machining time, which, coupled with longer wear, compensates for the higher cost of the tools.

Tufnol is a reinforced or laminated plastic

The type XT-1 tungsten carbide tipped saw 200 mm in diameter by 1.5 mm wide, and having 64 teeth. It is manufactured by Gomex Verktyg AB.

which has to be machined to shape after moulding. Here, again, the manufacturers have issued a booklet on machining, and recommend tools with a tungsten content of at least 18% to reduce wear.

It is often necessary to saw plastic tubes and extrusions for a variety of uses. Interwood Ltd, who supply various types of cutting machinery, saw benches and the like, showed a double cut-off squaring saw bench which used tungsten carbide tipped circular saw blades. This type of saw bench, having one blade in a fixed position and the other adjustable, could be used for cutting sheet or other shaped material to predetermined lengths.

Gomex Verktyg AB are manufacturers of tungsten carbide tipped saw blades of many diameters and widths. This company claims to have manufactured the thinnest tipped blade ever to have been made; it is the type XT and has a cutting width of only 1.5 mm (shown here). It can be used for plastics and plastic-bonded on plywood at very high speeds without burning or chipping the material. Diameters range from 125 mm to 250 mm and numbers of teeth from 40-80.

All these tungsten carbide tools should be diamond-ground for full efficiency.

Newton Abbott Engineering Co are agents for a number of Canadian precision machines which can be suitably adapted for making moulds and templates. The machine they were showing was the Newton-Mimik die-sinker, a precision vertical milling machine having a hydraulic tracer.

This tracer is shortly to be manufactured in this country under licence, and it has been suggested that in the not too distant future this unit may be made to considerably smaller dimensions, without impairing its efficiency in any way.

Soviet Exhibition, London

A number of diamond tools and precision machine tools were shown at the Soviet Exhibition, at Earls Court, London, from July 7 to 29, beside a small amount of equipment for oil and gas drilling.

At least one of the lathes, the 1K62, is already being sold in Britain, and a detailed description of this machine and its potential is to be found on p 150.

Among the lathes shown was a programme and tracer controlled hydraulic semi-automatic, suitable for short runs or piece production. A powerful main drive and high rigidity make it a suitable machine to use with sintered carbide tools.

The programme control system employs vernier-type slide position transmitters, which control the position of the copying slide; as the copying slide reaches a pre-determined position, signals are fed back to a comparing circuit which transmits a work signal to stop the slide, introduce a new dimension (longitudinal or diametrical) and restarts the slide.

The programme is set up on a control panel equipped with selector switches, which are set according to the dimensions on the working drawing; one to two minutes is the time allowed for setting up a programme. Diametric accuracy to within ± 0.05 mm and linear accuracy to within— ± 0.2 mm can be achieved with the programme control system it is claimed.

The contoured surface of a workpiece is machined by the copying slide with the aid of a two-dimensional hydraulic tracing system. Grooving and certain facing operations, which cannot be reproduced by the copying slide, are carried out with the facing slide.

The maximum diameter that can be machined over the bed is 410 mm and over the copy slide saddle is 125 mm; the maximum length accommodated, 500 mm. The copying slide can make a maximum of nine passes in one cycle and has a maximum longitudinal travel of 500 mm and a maximum cross working travel of 75 mm. Spindle speeds range from 81 to 2040 rev/min, summary working feeds of facing slide range from 15 to 400 mm/min.

Model Y3A-3M is a table semi-automatic ultrasonic machine for machining holes in diamond or other hard materials; depending on the hardness of the work-piece and the diameter of the hole being machined the operation takes

rom 2 to 4 hours to complete.

A self-energizing generator is built into the base of the machine. Approach of the table to the head is controlled by an automatic time regulator. Holes from 0.05 to 4 mm can be cut with this unit. The table speed when cutting diamond is 90 rev/min and when polishing, 180 rev/min. Head rotation is at 250 rev/min, while grinding wheel speed is 12,000 rev/min.

A number of grinding machines for carrying out different operations was also shown. They included the 5822 thread grinder, for use with single- and multi-edged wheels grinding in either direction. This machine is suitable for long runs as well as piece production; a compensating feed takes up wear of the wheel during use and diamond dressing.

The maximum diameter of work which can be accommodated is 200 mm, and maximum number of thread starts is 48. It will also grind internal threads to a minimum diameter of 25 mm and a maximum of 125 mm.

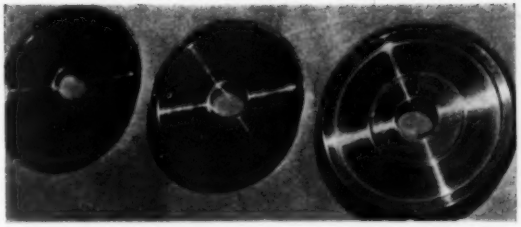
The 584M semi-automatic gear grinder grinds straight and helical spur gears with a saucer-shaped grinding wheel, the right side of one and the left side of the next tooth being ground simultaneously. The workpiece performs a slow rotary and traversing generating motion, mating with the profile of the grinding wheel. When one tooth is generated the wheel is brought out of mesh with the blank, which rotates in the same direction as in the process of generation, indexing through a certain number of teeth which has no common factor with the number of teeth in the finished gear.

Compensation for wear of the wheel during use and dressing is automatic.

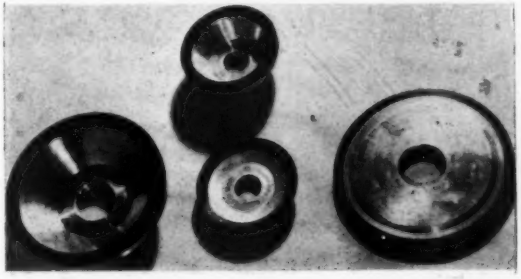
A semi-automatic surface grinder, Model 3722, being shown, has in-process active control for rough grinding on an automatic cycle. Maximum width of workpiece which can be accommodated is 320 mm; maximum length, 1000 mm, and maximum height—less magnetic chuck—400 mm, Table speeds range from 2 to 40 m/min. Fine vertical feed on automatic control is 0.005 mm for each traverse of the table.

A large jig borer, with vertical and horizontal spindle heads, had optical setting, giving accuracy to 0.002 mm. The working surface of the table is 1600 mm by 1000 mm; longitudinal travel of table was 1400 mm; maximum cross travel of vertical spindle head, 1000 mm. There are 18 spindle speeds ranging between 40 and 2000 rev/min.

Among the small cutting tools being shown was a selection of bonded diamond wheels (see illustration) and solid type involute carbide



Soviet tool plants produce diamond abrasive discs with organic binding. The discs consist of diamond-dust rings glued to aluminium foundations.

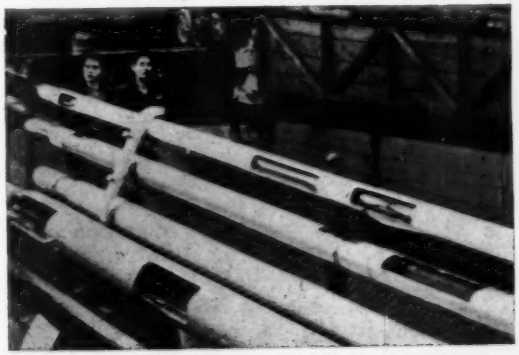


tipped gear cutters, of 9, 12 and 16 mm in diameter, and a number of pentagonal, hexagonal, square and triangular ceramic and tungsten carbide throw-away tips for turning, with special re-usable holders.

In the Oil and Gas Hall, turbodrills were being shown with a number of three-cone drilling bits. Model TC6-7½ in turbodrill, the one best known, uses diamond bits for drilling through the hardest rocks at shaft speeds of from 600 to 720 rev/min.

The three-cone bits are made from a number of steels, those for drilling through abrasive rock having teeth reinforced with granular hard metal.

There was very little information about many



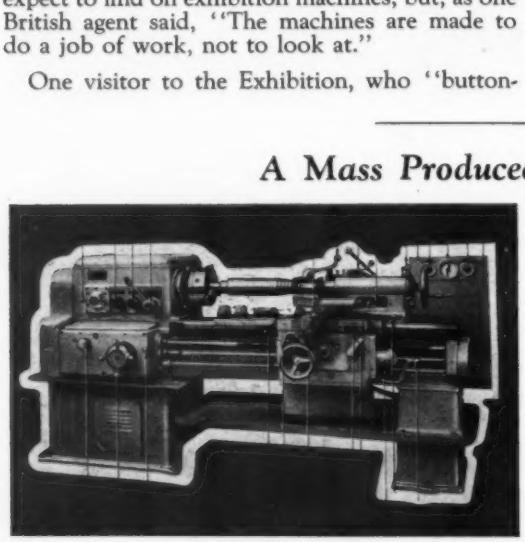
Some Soviet turbodrills; the second one from the top is the 7.5 in.

of the products shown and none at all on diamond products.

The finish on some of the machine tools was not quite up to the standard that one would expect to find on exhibition machines, but, as one British agent said, "The machines are made to do a job of work, not to look at."

One visitor to the Exhibition, who "buttonholed" me in the machine tool section, was enthusiastic about all he saw and was very surprised when I told him that machines and tools similar to what he was looking at were already available in this country from British firms, which rather suggests that British manufacturers may not be doing all they can to promote information about their best machines and tools at home.

A Mass Produced Toolroom Lathe



The Krasni Proletari 1K62 toolroom lathe, for high quality production with tungsten carbide or ceramic tipped tools, was recently introduced into this country from the Soviet Union. There are less than half-a-dozen in the country at the present time, and one was being shown at the Soviet Exhibition, 1961, at Earls Court, London.

Similar machines have been in use in France for over 12 months and reports suggest that their performance is comparable with other makes of lathes used for identical purposes.

The 1K62 is designed to carry out all the normal functions of a lathe: straight- and taper-turning, boring, facing, undercutting, parting-off, drilling, counterboring, and reaming; also, it is equipped with a number of stops to enable duplicate components to be machined to pre-set dimensions.

It can be used for cutting right- and left-hand, single and multiple start screws to almost any English, metric, module or diametrical pitch, and also spirals having pitches of $\frac{3}{8}$ in. and 7/16 in.

A hydraulic copy unit is available as an extra for the machine to be used for copy turning.

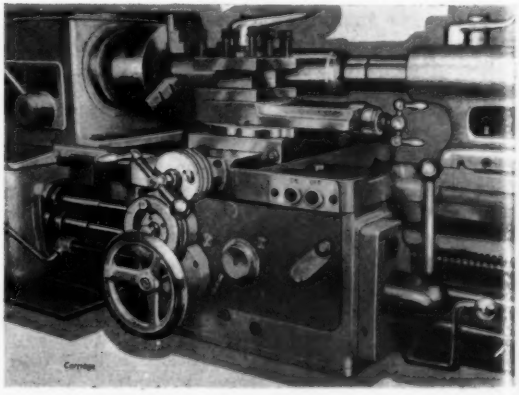
There are 24 spindle speeds, ranging from 12.5 to 2,000 rev/min, obtained through a belt-driven all-geared headstock; one experienced user has been reported as saying that the gear mechanism is complicated and the same range of speeds could be obtained if the number of gears was reduced by one third. However, as the gears, which are of induction hardened chromium-alloy steel, are produced on a transfer link line, adjustable to make any one of six sizes of gear used in the head, they are manufactured at low cost. The drive to the headstock is through a V-belt from a 400/440v motor rated at 13 hp.

Single-lever Control.

A rigid box-section bed having two flat and two prismatic ground slideways—carrying the carriage and tailstock—is mounted on two hollow pedestals, the left-hand one housing the motor for driving the headstock, the right-hand one containing the coolant reservoir.

A motor for quick traverse of the carriage is mounted in a recess at the right-hand end of the lathe bed. The carriage and cross-slide travel are controlled from a single lever, the direction of lever shift to engage any movement coinciding with one of four directions in which tool movement is desired; hand-wheels are also provided to make the same movements. The tool-slide carries a four-way tool-holder for normal turning and a rear tool-holder for grooving operations.

The carriage of the 1K62, showing 4-toolpost and slide list.



The tailstock, which has lever and bolt clamping, can be power-fed for drilling by attaching it to the carriage with a special locking device.

The table, below, shows the capacity of the machine, the maximum diameter of bar stock which can be accommodated may seem small compared with other machines for similar duties.

These machines are being produced at a rate of 40 a day, or approximately 14,000 a year, and are selling in this country at £1,750—a price which is likely to be increased in the near future. Delivery to customers in this country, according to Machine Tool Agencies Ltd. who are handling sales in Britain, is about 6 months.

Capacity of 1K62

Distance between centres	4 ft 8 in
Height of centres	8½ in
Maximum diameter of bar stock machined	1½ in
Maximum diameter of workpiece machined over lower part of cross-slide	6.3 in
Maximum diameter of workpiece accommodated over bed	1 ft 3¼ in
Maximum length turned (according to (distance between centres)	4 ft 4¼ in

Spindle

Spindle taper	Morse No. 5

Carriage

Maximum longitudinal travel (according to distance between centres)	4 ft 4¼ in
Maximum cross-slide travel	10 in
Maximum tool-slide travel	5½ in
Maximum swivel of tool-slide	± 90 deg
Number of cross-slides front	1
" " " " rear	1
Maximum distance from line of centres to edge of four-way tool block	9½ in
Number of tools in tool block	4
Maximum size of tool shank (width x height)	1 in x 1 in

Tailstock

Spindle taper	Morse No. 5
Spindle travel	8 in

Speeds and Feeds

Number of spindle speeds ...	24
Range of spindle speeds	12.5 — 2,000 rpm
Number of feeds	42
Range of feeds, inches per spindle revolution:	
longitudinal carriage feeds	0.0027 in — 0.163 in
cross-slide feeds	0.0013 in — 0.081 in

Livingston Laboratories in New Premises

Between May 29 and June 2 Livingston Laboratories Limited held open house in their new premises at 31 Camden Road, London, N.W.1.

The business of this firm is unique; they endeavour to supply instruments and equipment, from a number of sources, to solve testing, metering, measuring and similar problems which enquirers may have. Some of the instruments already supplied include portable equipment for measuring surface finish down to one microinch and a measuring machine for precise classification of small parts by thickness to tolerances of ± 0.000020 inch.

Not all the enquiries they receive concern the actual supply of instruments; in some instances a firm may want to know if there is an instrument made to do a specific job. Without any obligation, Livingston Laboratories will give names of suppliers of the equipment that they, with their expert knowledge, know will give the required service. They are enabled to do this through a very complete index of suppliers and equipment, built up over the years since 1948.

Any equipment Livingston Laboratories agrees to supply is first given exhaustive tests before being finally handed over to the customer; in this way any instrument can go straight into service with every confidence that it will do its required job.

The business was started 'by accident' by Mr. Livingston Hogg, M.I.E.E., M.Brit.I.R.E., an electronics engineer, and now Chairman and Joint Managing Director: in 1948 Mr. Hogg required a piece of equipment for a job he was doing for himself. At that time there was quite a lot of ex-Government equipment about but to obtain the one item he required he had to buy half-a-dozen. This little episode was repeated several times for different pieces of equipment until the unused items started to become embarrassing. However, several firms became interested in some of the equipment, one enquiry leading to another, and Mr. Hogg found himself with a business, the result of which is the brand new premises which the firm now own.

Continued from page 159

used as the uprights of a new jetty, which should in this way be provided with a very firm foundation.

Similar work, although on a smaller scale, has been carried out at Kangaroo Island, in the same district ; here, the bits used were 8 3/16th in. in diameter, but the method of work adopted was much the same. In both cases the bits were supplied by the Australian firm of Jules Joris Pty Ltd, of Sydney.

Transatlantic Trends

Grinding Comes of Age in the U.S.

By Morris M. Patterson

Editor of *Grinding and Finishing.*

There has been what seems to be a sudden and dramatic surge in the application of abrasives in the United States. It has actually not been sudden nor in the strict sense of the word, dramatic. But, what has actually happened is that where small groups were discussing abrasive machining, the groups have now the appearance of joining together in one common discussion.

The build-up to this event undoubtedly started many years ago. Two of the more recent events which have stirred comment on abrasive operations have been the development of man-made diamonds and more recently, a more vocal discussion of higher speed wheels. The advent of man-made diamonds has put a great deal of emphasis on diamond applications which in turn has resulted in increased research, development and understanding of diamonds. Again, much of the research and development had its beginning a number of years ago, but they required the impetus of the discovery and competition to bring the merits of diamond applications to the attention of the user.

In the case of higher speed which as yet is just in the talking stage, there have been several factors which have kept this development in the background. The most important has been the abrasive manufacturer's reticence to risk large product liability suits on higher speed products, which although not specifically restricted by the safety code, are a potentially more dangerous operation. A second restriction on higher speed wheels has been the eternal triangle of abrasive manufacturer, machine tool builder and user. This situation is such that the abrasive manufacturer is waiting for the machine tool manufacturer who is waiting for the user to make the first move for the release of this development. It is quite obvious that the user is waiting for either or both of the other two. It now appears that a number of the abrasive manufacturers have begun to release technical information and products for higher speed application.

Still another controversy which has helped to stir conversation has been the competitive development of crush and cemented diamond particle form dressing. Both of these methods are for production applications only. The older being the crush form method with the new cemented diamond particle method making a real challenge. The reported advantage of the new method is that contrary to the old, it does not force broken grain particles into the face of the wheel, but rather dresses the form into the face of the wheel, leaving a clean, sharp surface.

These controversies are just a few of the more important or possibly more widely discussed of the many contributing developments. One other equally important factor has been the recent release of a great deal of strictly basic material

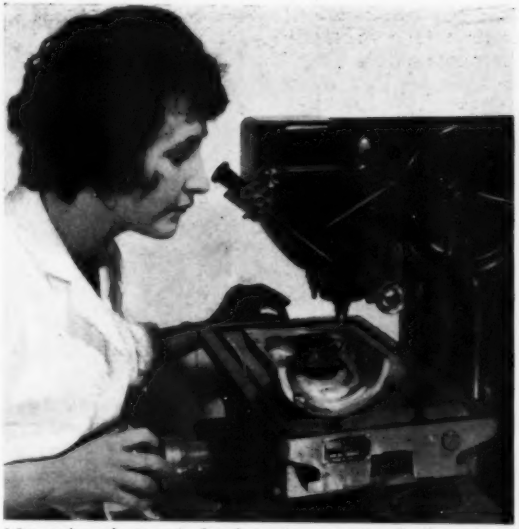
which although considered common knowledge has not heretofore been written. This is the type of material which has in the past been handed down from the expert to the apprentice.

All these have contributed to the appearance of a sudden and dramatic coming of age by the manufacturers of the United States in the importance of abrasive machining.

Hardness Testing Pin-Points Causes of Engine Failure

Often, premature failure of an engine is caused by the over-heating of certain parts such as pistons, rings, bearings, gears, valves and sparking plugs. The disposition of these parts within the engine block makes it practically impossible to measure their working temperatures with the usual temperature measuring devices, so another method has been devised by the scientists of Shell Research Ltd, at the Research Centre, Thornton, Cheshire.

Their method relies upon the hardness change of a metal when it has been heated and then cooled, the extent of the change depending upon the maximum temperature reached. This fact in itself is not new, but Shell have applied it to taking the temperature of moving parts in cars and in large engines used in ships and trains.



Measuring changes in hardness in a sectioned alloy piston on a Vickers diamond pyramid hardness testing machine fitted with a Grimston compound table. (A Shell photo)

Usually it is only necessary to compare the original hardness of an engine component with

COMPENTRAD LTD

FOR

DIAMOND IMPREGNATED TOOLS

CONTINUOUS RIM CUTTING DISCS - SEGMENTED DISCS UP TO 3 METER DIAMETER - GRINDING WHEELS - CUP WHEELS - STRAIGHT WHEELS - PENCIL EDGING WHEELS

THE BEST TOOL FOR THE JOB

TEL. MONARCH 1257
9768
9769

31, THROGMORTON STREET
LONDON, E.C.2

its hardness after running to determine with accuracy the maximum temperature reached in the range of 100 deg C to 1000 deg C (212 deg F to 1832 deg F). When the metal of a particular engine component is not suitable for recording accurately the maximum temperature reached, small inserts of a suitable alloy can be inserted in the part under study. The change in hardness of the insert will then give a measurement of the maximum temperature reached. A number of alloy inserts has been developed to do this.

The use of a technique such as this can remove much of the guesswork from the diagnosis of failures and also bring about a quicker realisation of what to avoid in new design.

To make their hardness measurements the Research Centre is using a Vickers diamond pyramid hardness testing machine, giving a very large depth of penetration, fitted with a Grimston compound table capable of lateral and longitudinal movement.

*Honing of Heading and Upsetting Dies**

by Dr. Ing. G. Haasis

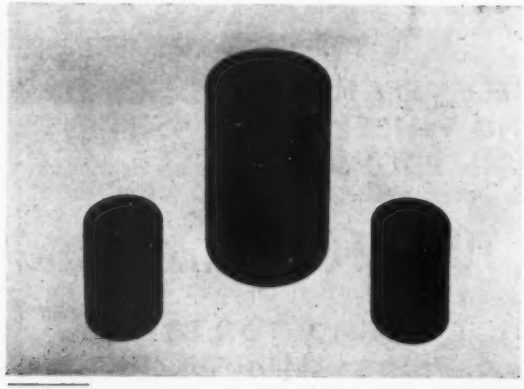
The application of honing in the manufacture of heading and upsetting dies, *i.e.* in the final machining of the die bore, has in recent years created a number of new, simplified methods of production ensuring an improvement in the quality of the die and in the quality of the belts, hinge pins, rivets, etc, headed in it. In nearly all cases it has been possible to make the entire production cycle in the manufacture of dies considerably more economical.

The results achieved show that honing offers considerable advantages over previous methods especially in the case of small and relatively long straight-through bores.

The old method and the new

The sequence of operations in the production of dies used to be: drill, ream, harden, and, in many cases, ream again to remove the layer of scale, then grind and, finally, lap. In some cases the dies are also chromium-plated and then lapped to size.

Fig 1. Bolt-heading dies, an example of the type of work that can now be produced economically by honing.



In the case of the new method, only honing is necessary after hardening. The net honing time lies in the region of 1-5 minutes, depending on the machining allowance, for example, the amount of distortion following hardening. Up to 0.2 mm can be removed from the diameter of the die bore.

The advantages of honing

Honing is considerably faster than lapping and grinding and in the case of die bores ensures accuracy of size and form. Frequently small contractions are required in the accuracy of the form, either at the tip near the head of the bolt, because it is at this point that the greatest compression of the material takes place during heading and because the die becomes wider here in the course of time or at bottom near the shank in order to be able to eject the headed bolts more easily. Honing meets these requirements in a simple manner.

The surface finish required on die bores is in all cases less than 1.0 micron R maximum. Provided fine-grain honing tools of the appropriate type are used, this finish can be obtained in the time stated above.

The relatively fine surface finish ensures a considerable increase in die life. Various bolt manufacturers have found that the advantages of the smooth surface of honed dies are far greater than had originally been assumed. The production of a favourable surface roughness has resulted in an increase in die life that was not thought possible some years ago. The following example confirms this:

A certain manufacturer used to use some 15 to 25 dies a week in the production of one size

* Reprinted with kind permission from *Wire World International* 1961 Vol 3 pp 21-24 (Feb).

of bolt. Since the dies have been honed, only 4-6 are needed in the same period. Such results, however, are not isolated cases, but are obtained in many bolt factories where the dies used are honed during manufacture.

This fact becomes all the more important when one considers that the time normally spent in changing the dies can be saved and is available for production purposes. A genuine increase in output is thus achieved.

The smooth surface, however, not only increases the life of the die, but also protects the entire machine. The easier flow of material along the smooth surface of the bore ensures smooth operation during heading and ejection of the bolts. Consequently the ejector pins also have a longer life. The smoother operation of the machine is explained by the perfectly cylindrical form of the die bore, and the dimensional accuracy of the bolts and hinge pins produced is considerably improved by the quality of the bore.

The honing process

In the case of steel dies, it is normally only the distortion after hardening that has to be considered as a machining allowance for honing. The distortion in certain bores may be as much as 0.15 mm. In such cases it is recommended that the honing process be divided into two

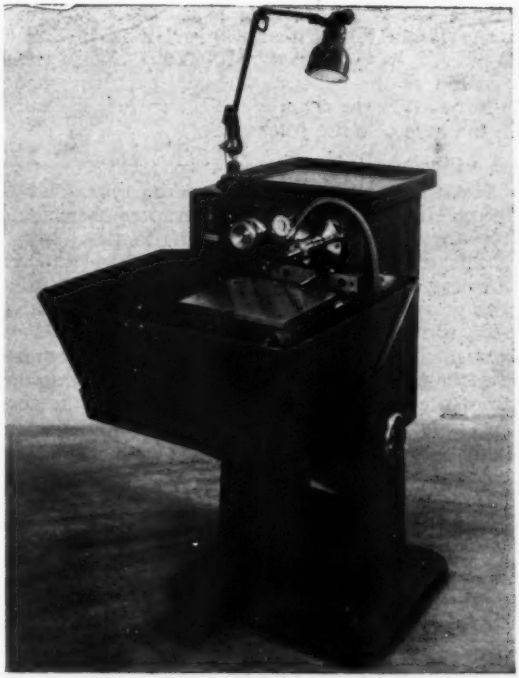
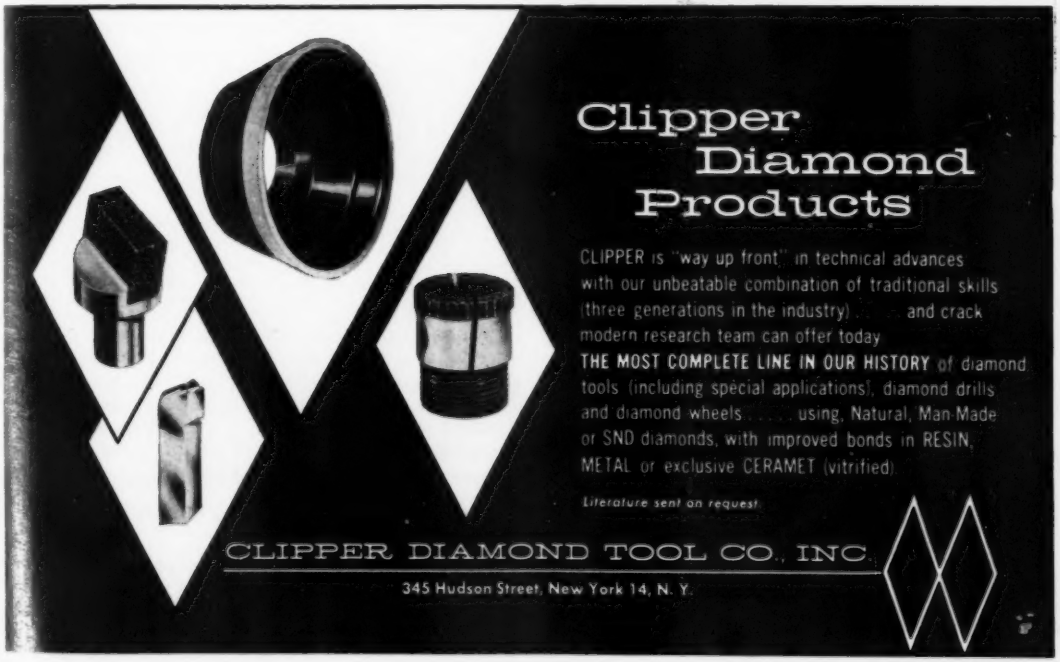


Fig 2. Horizontal hand-honing machine type HHM 70 with tool fitted and sizing device mounted on side.


Clipper
Diamond
Products
CLIPPER is "way up front" in technical advances with our unbeatable combination of traditional skills (three generations in the industry) and crack modern research team can offer today
THE MOST COMPLETE LINE IN OUR HISTORY of diamond tools (including special applications), diamond drills and diamond wheels . . . . . using, Natural, Man-Made or SND diamonds, with improved bonds in RESIN, METAL or exclusive CERAMET (vitrified)
Literature sent on request
CLIPPER DIAMOND TOOL CO., INC.
345 Hudson Street, New York 14, N. Y.

operations rough honing with a coarse-grain stone (grain 80-150) and finish honing with a fine-grain stone (grain 320-400). With this division of the process, a decided improvement is achieved in the accuracy of the form, especially in the case of close tolerances.

(a) *Suitable honing machines*

Horizontal hand-honing machines types HHM 70 and HHM 40 have now been employed successfully for a number of years to hone dies. Most of the dies concerned are light in weight, so that the honing can be carried out manually without any difficulty. Figure 2 shows a die being honed in such a machine. There is a special advantage in the fact that no clamping fixtures are needed and accordingly no clamping times are involved. The decisive factor is the net honing time alone. The component is guided on the tool to and fro by hand and so machined (Figure 3).

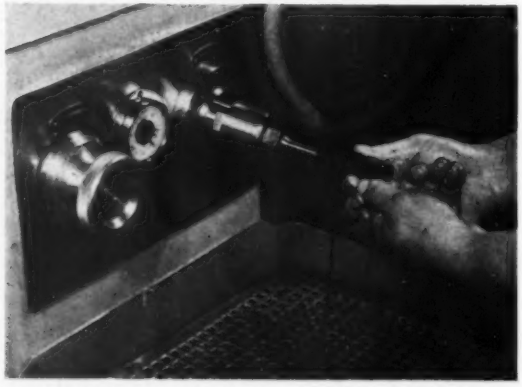


Fig 3. Honing a bolt die on a horizontal hand-honing machine. The component is guided to and fro on the revolving and expansible honing shaft by hand.

In the case of larger dies, machining is more economical with an additional guide table fitted to the machine (Figure 4). The component is placed in a fixture on the sliding table and guided to and fro. In this way, alignment errors can be avoided, especially in the case of long bores.

(b) *Economical honing tools*

The honing tools used in such cases are honing shafts with a honing lining of large area. The lining itself is applied direct to the basic body in the case of this tool, so that expansion of the tool is obtained with the internal cones.

Honing shafts of this type are made in sizes ranging from 2.2 to 15 mm. They are available in the form of standard or special types with any desired grain and hardness (see Figure 5).

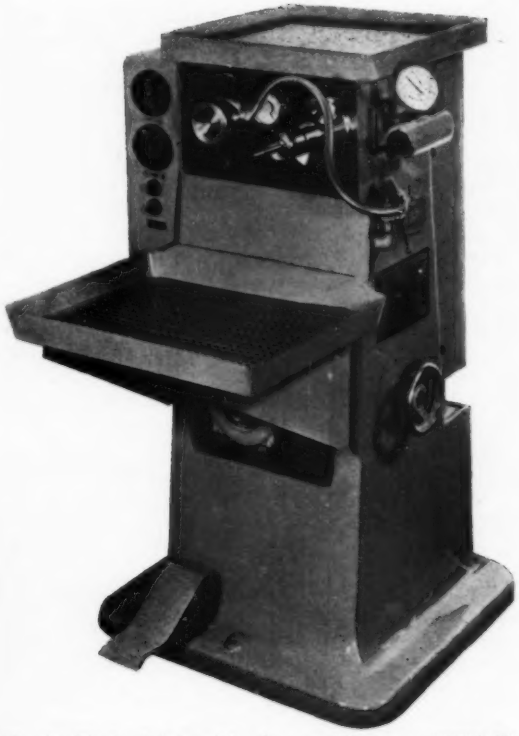


Fig 4. Horizontal hand-honing machine type HHM 70 with built-on sliding table for heavy components.

Today only electrolytically bonded diamond honing tools are used for carbide dies (see Figure 6). These tools retain their shape extremely well and have a high cutting capacity and long life. They cannot, however, be used except in the case of materials having a hardness of at least 62 Rc.†

The hardness of steel dies in most cases is only 58 Rc. For this reason it is better in this instance to use normal stone linings as in the case of the honing shaft.

When using diamond tools, high cutting speeds are necessary for good results. The horizontal hand-honing machines shown in Figures 2 and 4 are specially designed for this method of operation. On these machines, therefore, carbide dies can be machined advantageously with diamond honing tools.

Production examples presenting a number of special features

Special attention is now drawn to two production reports on the honing of dies.

†See IDR 1959 Vol 19 pp 70-71 (Apr).

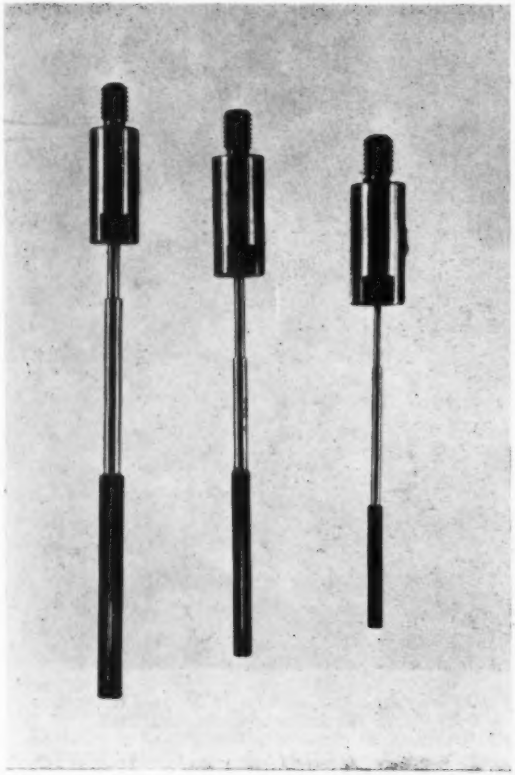


Fig 5. Honing shafts of standard design and of different diameters. The inserts are used for expanding the honing linings.

(1) *Honing of a steel die*
(see production report 1).

When machining this relatively long die bore, a good flushing effect is obtained with the so-called forced-feed lubrication system. One end of the bolt die to be machined is inserted into a sleeve in such a manner that the die can easily be held in the hand during honing. The machine is connected to a long hose at the rear, so there is no obstruction during honing. The coolant is compelled to flow from the hose, through the sleeve, into the die, between the tool and the wall of the bore. As only slight gaps occur between the tool and the wall of the bore, the coolant comes out at an increased speed. In this way, the flushing and lubricating effect is considerably improved (see Figure 7).

It is also found that the honing shafts in particular retain their cutting action longer when the forced-feed lubrication system is used, owing to the increased flushing effect, than when an outside coolant supply is used. All particles of abrasive material are positively removed by the faster flow of coolant.

(2) *Honing a carbide die with diamond honing tools*
(see production report 2).

In this connection it should be mentioned that, given a die of appropriate hardness, the cutting action and life of the diamond honing shafts can be considerably increased by reversing the direction of rotation of the honing spindle after honing about 20-25 bores. This is explained by the fact that the points of the diamond grains form ' table mountains ' on being ground down and obtain a sharp edge on the rear face during the first period of rotation. On the return of the spindle, *i.e.* in the second period of rotation, economic use can be made of this cutting edge.

In order that full use may be made of this knowledge, the honing machines described in Figures 2 and 4 are equipped with a reversing switch for right- and left-hand rotation of the honing spindle. By changing the direction of rotation of the spindle, it is also found that even with a more or less worn out diamond lining

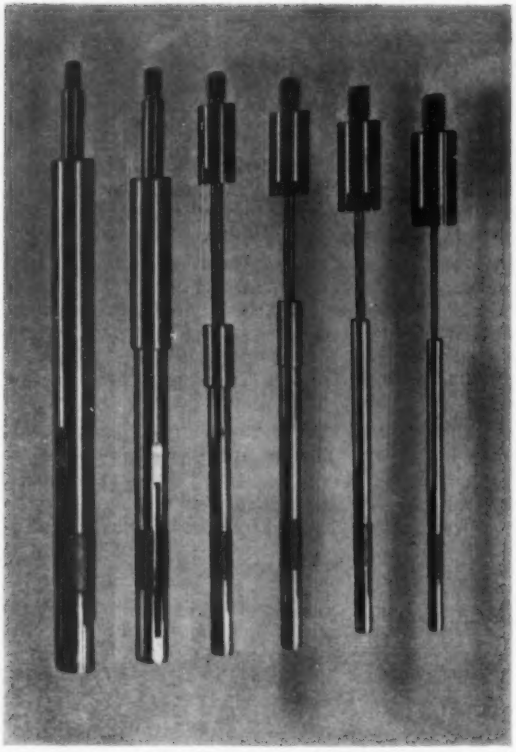


Fig 6. Diamond honing tools of different diameters with electrolytically applied metal bond.

Production report 1.
Honing steel dies

Component:	Bolt die
Material:	Heat-treated steel, 58-60 Rc
Bore:	8.8 mm dia. 42 mm long
Preliminary machining:	reamed, hardened
Form error:	0.08 mm

Operation:	
Machine used: Horizontal honing machine HHM 70	Tool used: Precision-honing tool MhK-ND
Honing stone: Honing shaft 8.7 mm dia Grade NK 100 Q/110	Coolant: Special honing oil ' HOHO-PLUS '
Honing movement: manual	Reciprocation speed: 2-3 m/min
Infeed: mechanical	Speed: 1600 rpm
Result:	
Stock removal: 0.1-0.15 mm Surface finish: before honing: 10 micron after honing: 1 micron	Honing time: 15 min Form errors: taper: 0.005 mm out of round: 0.003 mm

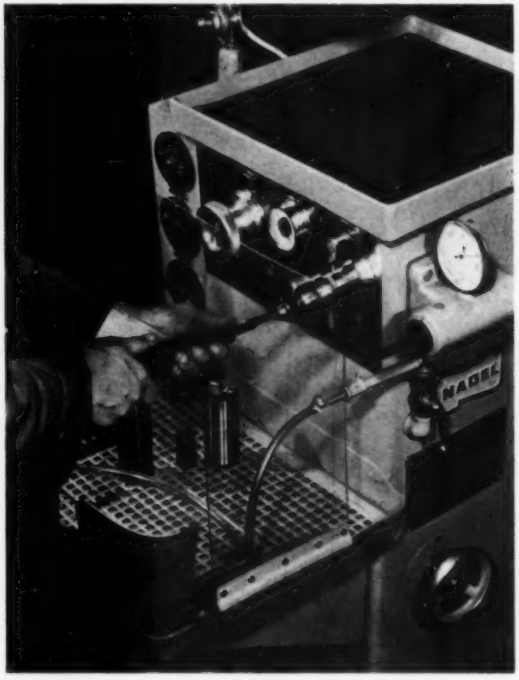


Fig 7. Honing a bolt die with forced-feed lubrication on a horizontal hand-honing machine.

Production report 2.
Honing carbide dies

Component:	Carbide die
Material:	G 6 carbide
Bore:	6 mm dia 40 mm long
Preliminary machining:	drilled and polished
Form error:	0.05 mm

Operation:	
Machine used: Horizontal honing machine	Tool used: Honing shaft (a) 5.75 mm dia. (b) 5.90 mm dia.
Honing stone: Diamond honing shafts 60 micron	Honing oil used: Special honing oil ' HONO-PLUS '
Honing movement: manual	Reciprocation speed: 2-3 m/min
Infeed pressure: mechanical light	Speed: 2000 rpm
Result:	
Stock removal: 0.2 mm Surface finish: before honing: 10-12 micron after honing: 1 micron	Honing time: 30 min Form errors: taper: 0.004 mm out of round: 0.002 mm

the machining times remain the same and the cutting ability of the diamond grains is maintained until they are finally worn out.

A particular point that will be noted from the production report is that the large stock removal of 0.2 mm is obtained with two different honing tools. First a honing shaft of 5.75 mm diameter is used and then a honing tool of 5.90 mm diameter in order to reach the final size of 6 mm. This division is necessary so that the honing shafts do not have to be expanded beyond their capacity and consequently retain their cutting ability throughout their lengths.

In the case of the carbide die mentioned in production report 2, a special advantage of the diamond honing tool used is the accuracy of form that can be achieved. The final machining of carbide dies often used to be carried out with drilling carbide, but this had the great disadvantage that it produced a bad form of bore. With the diamond honing shaft, bell mouthing or taper bores can be avoided in all cases.

Australia's Largest Diamond Drill Bit

Our illustration shows a most unusual and highly attractive core, in the largest diamond drill bit ever manufactured in Australia. The one shown, however, is far from being the usual core, and, if the normal one is less pleasant to look at, at least it is extremely interesting.

The bit is eighteen inches in diameter, and contains in its 9/16th in. wall some 3,000 stones amounting to about 200 carats. It has been supplied to the South Australia Department of Mines for work on harbour extensions at Port Lincoln. It is screwed into a 9 foot long steel tube, which in turn is jointed to a normal 'N' rod through a reducing coupling.

Drilling is taking place in very hard granite in Port Lincoln harbour, and the circumstances have dictated the special methods employed. The drilling machine is located on a 30 ft high steel scaffolding, set up in 25 ft of water, and the bit is lowered into position by a crane. A diver collars the bit in the exact spot, and the drilling is then carried out to a depth of 8 ft. An EX bit is then used, to a depth of 7 ft 6 in., to drill in the centre of the core and an expanding loxin is placed in the hole to assist in its withdrawal. The core is broken away from the bedrock by

means of a small explosive charge placed in the kerf, and hoisted out by crane.

The eighteen inch diameter holes thus produced are to be used as the housings for steel girders

Continued on page 151

THE HENDERSON DIAMOND TOOL COMPANY LTD.,

43-45 ALLESLEY OLD ROAD, COVENTRY

Telephone : Coventry 75617

MANUFACTURERS OF DIAMOND TOOLS.

ALL TYPES OF ABRASIVE DIAMOND TOOLS

RESET AND RETURNED WITHIN **48 HOURS**

OF RECEIPT AT THE ABOVE OFFICE.

TOOLS FOR SPECIALISTS MADE TO CUSTOMERS OWN REQUIREMENTS

CLASSIFIED ADVERTISEMENTS

2d. a word, minimum 4/-. Box Numbers 1/- extra.
Address Box No. replies to : N.A.G. PRESS, LTD., 226 Latymer Court, London, W.6.

TIME RECORDERS.—Sales—Rental Service. Tel. HOP. 2239. TIME RECORDER SUPPLY & MAINTENANCE CO. LTD., 157/159 Borough High Street, London, S.E. 1.

MR. M. DAVIDSON, F.S.M.C., qualified opthalmic optician, is in constant attendance, for sight-testing and dispensing of optical prescriptions, at the HATTON OPTICAL CO., 19 Hatton Garden, E.C.1. (Tel. HOL 8193).

JEWEL BEARINGS for watches, precision industries and the jewellery trade—high grade quality—very competitive prices. Sawing, drilling, enlarging, turning, recessing of synthetic ruby and sapphire, germanium and other hard materials. We are interested in being represented in other countries. S. I. CARDANA, ORNAVASSO (NO.), ITALY.

DIAMOND POWDERS, purity 98% +, recovered from diamond cutting and polishing powder (0 — 40 micron) for $2 (U.S.) crt. DIACEM, Schupstraat 9, ANTWERP, BELGIUM.

DIAMOND POWDERS mesh and microns, purity 98/99%. Also recovered diamond powders 0-40 micron available at the price of US $1.95 per carat. Point and Splinters. **AFRIKA DIAMANT BOART, VESTINGSTR. 53, ANTWERP, BELGIUM.**

IF YOU WANT TO KNOW what is going on in the diamond industry ask to be put on the mailing list of *HABIT NEWS*, a journal which is published quarterly by HABIT DIAMOND TOOLING, LTD., Lurgan Avenue, W.6.

IT WAS MACMILLAN, not Habit, who said "You've never habit so good"—has he changed his mind now he's had so many 'grouses'?

FOR HIGHEST CASH PRICES for used boart and diamond fragments contact DAVID GRUBER, DIAMOND EXCHANGE & MART, 57 Aspenlea Road, W.6.

HABIT's lowest price for the re-setting of a diamond into a simple shank is 7s 6d and such an operation cannot be carried out for less—even by the one-man business operating in a backyard shed.

IF YOU WANT TO KNOW why HABIT TOOLING is held in such esteem by large and small concerns alike—come and see for yourself! The HABIT factory welcomes visits by either individuals or parties. This invitation is extended to include our competitors. HABIT DIAMOND TOOLING, LTD., Lurgan Avenue, W.6.

EXPERIENCED industrial diamond polishers required for new factory in Midlands area. Permanency. Pension Scheme, top rates and 40-hour week. BOX 2113.

SPACE PROGRAMME. HABIT needs more room. Any information leading to the acquisition of suitable premises in the S.W. London area will be suitably rewarded.

WILL man who left parcel of cuttable melées on beer counter of the Chandos pub. Trafalgar Square, on Bank Holiday Monday last, dial WHI 999. His drinking Habits and lack of memory will not be disclosed to his employer, family or friends.

FOREMAN industrial diamond polisher to take charge department in new factory in Midlands. Strict confidence observed. BOX 2114.

HABIT wish to get a new slant on business efficiency and in consequence have vacancies in status positions. Applications invited from retired Field Marshals, Admirals, Air Marshals and particularly ex-Public Company directors and top brass Civil Servants. Successful applicants must be prepared to undergo extensive Public Relations training and be groomed for top level negotiations with both sexes. Services types must produce baton, gold braid and demob. papers. Apply in strictest confidence to Commodore Cholmondly-Curtis at Habit House, Lurgan Boulevard, London, W.6. Enclose stamped, addressed envelope.

SALES REPRESENTATIVES with common sense and some knowledge of engineering workshop practice are required by Habit Diamond Tooling, Limited, Lurgan Avenue, London, W.6., to reside and operate in all areas in Great Britain and overseas. Applications will not be considered from anyone who:

(a) Leans for support against bars in public houses, hotels and clubs.
(b) Pays undue attention to the games of golf, cricket, football, snooker, etc., to the detriment of his work.
(c) Does the household chores in order that his wife may get to work on time.
(d) Cannot readily do a normal day's work from 8 a.m. to 6 p.m., plus if necessary.
(e) Indulges in excuses regarding business recession to cover up laziness or inability.

There are fine prospects with HABIT for the man who is prepared to work and 'use his loaf.'

IMPREGNATED DIAMOND PRODUCTS. Foreman possessing wide practical experience of the manufacture of wheels in particular and other products in general, such as mining drill bits, oil-well reamers, reinforced concrete slicing discs, etc., is required to augment existing experienced personnel engaged on manufacture and development of a similar nature. BOX 2115.

HABIT is seeking the services of a Toolroom Foreman who is a specialist in mould production and press tool manufacture. Men residing in Gloucestershire or Kent who kid themselves that they possess unusual Tallents need not apply—which also goes for men already engaged in the Diamond Tool Trade.

ADVERTISERS' INDEX

	Page
Clipper Diamond Tool Co. Inc.	155
Compentrad Ltd.	153
Diamant Boart	143
Drukker, D. & Zn. N.V.	144
Endecotts (Filters) Ltd.	157
Habit Diamond Tooling Ltd.	Cover III
Henderson Diamond Tool Company, Ltd., The	159
Impregnated Diamond Products Ltd. ...	Cover IV
Indusmond (Diamond Tools) Ltd	141
Industrial Diamond Co. (Sales) Ltd. ...	Cover II
Triefus & Co. Ltd.	Cover I
Wolverhampton Diamond Die & Tool Co. Ltd.	143

INDUSTRIAL DIAMOND ABSTRACTS

Industrial Diamond Information Bureau,
2 Charterhouse Street, London, EC 1.
Telephone : FLEet Street 1577

1961 Volume 19
AUGUST

DIAMOND MINING AND INDUSTRY

A transistor device for controlling grinding to dimensions

A. Ya. Kylagin. *Machines & Tooling* 1960 Vol 31 (12) pp 27-28 (Dec) (Original in Russian)
1 illustr, 3 ref. *D* *Chc Vfd Wp*

Market reports

H. Wins & coll. *Diamant* 1961 Vol 4 (31) pp 27-31 (Apr-May) (In English, French and Flemish)

General survey of world diamond markets, including London, Antwerp, Amsterdam, Paris, Tel-Aviv and Toronto. *K* *F.251.31:.12*

Tanganyika mining in 1960

Anon. *S Afr Min Engng J* 1961 Vol 72 Pt 1 (3563) pp 1145, 1147, 1149 (May 19)

The article gives an overall picture of mining and prospecting in Tanganyika in 1960. Diamonds again proved the mainstay of the country's mineral products. Prospecting for diamonds was carried out extensively in many parts of the country, and was of a reconnaissance nature designed to delimit favourable areas for detailed examination later. Africans are being encouraged by the government to look for minerals in their own locality. *B* *Eb.12.364/F.13.364*

De Beers Consolidated Mines, Limited

Anon. *S Afr Min Engng J* 1961 Vol 72 Pt 1 (3562) pp 1105-1107 (May 12)

Although the total value of sales in 1960 was less than that in the record year of 1959, the quantity of diamonds handled by the various producers organisations are said to have increased. This, it is claimed, is largely due to a substantial quantity of stones being purchased by the Diamond Corporation from Russia and Sierra Leone.

An abrasive diamond grit used in the manufacture of grinding wheels is being synthesised at Springs, near Johannesburg. These synthetic industrials are being produced, it is stated, as a measure of insurance against the possible interruption of supplies from the Congo.

A very large prospecting campaign is being carried on in many parts of Africa, it is stated, and the old De Beers Mine at Kimberley is to be re-opened.
D *Eb.12.361/F.251.361/Kmf:Ha.361*

Ore-dressing notes. Diamonds : dressing methods reviewed

Anon. *Min Mag, Lond* 1961 Vol 104 (5) pp 283-284 (May)
D *Hz.1456.21*

Trawlers ' fishing ' for diamonds

Anon. *Daily Express* 1961 (19009) p 4 (July 10)

Russian trawlers are using suction pumps to ' fish ' for diamonds off the West Coast of South Africa, says the Marine Diamond Corporation of South Africa. The corporation has protested to Dr Verwoerd.
D *Ebz F Hd.361*

Coastal diamonds in South-West Africa

Anon. *Financial Times* 1961 (22,432) p 13 (July 3)

It is reported that fresh steps are being taken aimed at working the long disputed off-shore diamond deposits.
D *Eb F.12.362*

Basutoland kimberlites

J. B. Dawson. *Nature, Lond* 1961 Vol 189 p 475 (Feb 11) ; *IMM Abstr* 1961 Vol 11 (4) p 101 (Apr-May)

A prospecting programme, initiated in 1954, has led to the discovery of a new predominantly basaltic kimberlite province to the east of the micaceous kimberlite province of the Orange Free State.
X *Ebb.12.361*

The Israel diamond story

Anon. *Gemmologist* 1961 Vol 30 (358) p 97 (May)
D *F.351*

The world's diamond industry (contd.)

A. Moyar. *Gemmologist* 1961 Vol 30 (358) pp 99-100 (May)

This part of the survey deals with the problem of illicit mining in Sierra Leone and how this has been considerably reduced in the past two years. To be concluded. *D* *F.12.3672*

The gamble in diamond digging

Anon. *Gemmologist* 1961 Vol 30 (358) p 90 (May)

A gamble in alluvial diamond mining paid off in Sept it is stated, when a rich pothole was discovered on the Vaal River at Longlands, near Barkly West in Griqualand West. *D* *Ebe F.12.361*

CONTENTS

Diamond Mining and Industry...	A197	Rock Drilling	A206
Physical, Chemical, and Mechanical Properties of Diamond	A199	Wire Drawing	A207
Physical, Chemical, and Mechanical Properties of Hard Materials	A199	Grinding and Polishing of Carbides and Metals	A208
Diamond, etc, in Instruments	A200	Machining Processes and Developments ...	A212
Hardness, Wear Testing and Precision Gauging	A200	Production, Grading and Recovery of Abrasive Particles	A215
Truing of Grinding Wheels	A201	Tool Production...	A215
Precision Machining of Metals	A204	Powder Metallurgy	A216
Cutting and Machining of Stone, Glass, etc ...	A205	Miscellaneous	A217
Gem Polishing	A206	Patent Lists	A217

Société Minière du Bécéka

Directors' Report. *Min J* 1961 Vol 256 (6564) p 676 (June 9)

An interesting deposit has been located, it is stated, in the Katska area, Congo Republic, and prospecting is still going on. The Company's production for 1960 is reviewed. *D* *Ebb F.12.365*

Is there a threat to the industrial diamond market ?

Anon. *Min J* 1961 Vol 256 (6564) p 671 (June 9)

Reviews the effects of synthetic industrial diamond on the market. The net increase in actual industrial consumption is said to be largely due to the work of the Diamond Research Laboratory.
D *Fh.251*

Mining miscellany

Anon. *Min J* 1961 Vol 256 (6564) p 662 (June 9)

According to *Soviet News*, an expedition has been sent to North Yakutia to prospect for more diamond deposits. It will work in the basin of the Riven Birekte and explore an area of 3,800 sq. miles. It is said that diamond prospecting is to be conducted on a much wider scale in Yakutia.
D *Ebe Hd.332:.12.33*

Mining miscellany

Anon. *Min J* 1961 Vol 256 (6563) p 631 (June 2)

It is stated that Russian geologists are leading parties of Guineans to explore for diamonds in Guinea.
D *Eb.3671:.12.33*

Diamonds in the upper Mazaruni

L. L. Fernandes. *Rep geol Surv Brit Guiana* 1959, Georgetown, 1960 pp 61-62 ; *IMM Abstr* 1961 Vol 11 (4) p 101 (Apr-May)

Diamondiferous gravel was found at localities in the Mazaruni, Partang, Karaurieng, Tukpung and Aurukung river beds, in all cases occurring in rapids
X *Ebe F.12.3474/Ef F.12.3474*

Mining a vertical kimberlite fissure at Stat Diamonds (Pty) Limited

H. F. Allan. *J S Afr Inst Min Metall, J'burg* 1961 Vol 61 pp 310-318 (Jan) ; *IMM Abstr* 1961 Vol 11 (4) p 107 (Apr-May)

In the early underground history of the mine, Winburg district, Orange Free State, the stoping method used was overhand shrinkage. Later underhand stoping was employed, a modification of which has been in use for approximately 4 years. The vertical depth below surface at which stoping is now taking place and the fact that it is now possible to conduct dry mining operations have led to the recommencement of shrinkage stoping in certain sections of the mine.
X *Ebb.12.361*

Mineral resources of Brazil, Vol 1—Nonmetallic materials

S. F. Abreu. *IMM Abstr* 1961 Vol 11 (4) p 100 (Apr-May) (Original in Portuguese)

Book, Ministerio do Trabalho Industria e Comercio, Instituto Nacional de Technologia, 1960. 471 pp, illustr.

The first 33 pages contain a preface, notes on the geopraphical distribution and production of the main minerals in Brazil, 1958 production figures, sufficiency and scarcity of primary materials, and distribution of main mineral deposits (metallic and non-metallic) in Brazil. Industrial Diamonds are covered in chapter five, and diamonds and gemstones in chapter seven.

[Not in library of Industrial Diamond Information Bureau].
D *Bc.12.2581.346.52/Eb.12.2581.346.52*

Diamond rush in British Guiana

Anon. *'Mindrill' Bits & Pieces* 1961 Vol 14 (3) p 6 (Mar)

It is reported from Georgetown, British Guiana, that recent rich diamond finds have started a big rush to Ekereku, a tributary of the Cuyuni River, in the interior. *D* *Ebe F.12.3474*

Diatopics : Russia may have huge diamond reserves by 1965

Anon. *'Mindrill' Bits & Pieces* 1961 Vol 14 (3) p 5 (Mar)

According to the *Birmingham Mail*, diamond production of the USSR will increase by 1,600% by 1965 as compared with 1958. This means that the Soviet Union could be producing more industrial and gem diamonds than the rest of the world put together, with the obvious disastrous consequences for such countries as South Africa and Holland.
D *F.12.2581.33*

Diamond industry's activities during past year : Some interesting facts and figures from report of De Beers' Directors

Anon. *Diamond News* 1961 Vol 24 (8) p 19 (May)
W *F.25.361*

South Africa as producer of synthetics

Anon. *Diamond News* 1961 Vol 24 (8) pp 24-25 (May)

South Africa's role in the world's diamond market is expected to increase as a result of the production of synthetic diamonds there. China and the USSR are considered to be the only two countries who might find it economic to follow the South African and US lead in synthetic production. It is thought that the use of natural diamonds in industry may decline as the price of synthetic diamonds reduces.
W *Fh Ha.361*

Diamonds at Mining Congress

Anon. *Diamond News* 1961 Vol 24 (8) p 29 (May)

Summaries are given of the following papers read to the seventh Commonwealth Mining & Metallurgical Congress : (*i*) Diamond recovery in Southern Africa, by R. J. Adamson, (*ii*) Diamond mining practice in South Africa, by G. S. Giles ; (*iii*) Industrial Diamond Research by R. G. Weavind and J. F. H. Custers.
W *F Hd.361/F Hg.361/Fc.131.361*

New Premier plant

Anon. *Diamond News* 1961 Vol 25 (8) p 25 (May)

An additional plant of a designed capacity of 500,000 loads/month is to be erected at the Premier Mine.
W *Eb F H.2635.361*

USSR's portable diamond detector

Anon. *Diamond News* 1961 Vol 24 (8) p 4 (May)

A portable device for detecting diamonds, other gemstones, and scarce metals in soil samples has been developed in the Soviet Union. The system depends on the use of radio-isotopes and is said to be cheap to operate and exceptionally efficient.
W *Bna F Hz Prw Syb*

DIAMOND TECHNOLOGY

First published 1942 as " Production Methods for Diamond and Gemstone." The second edition of this book by P. Grodzinski has been revised throughout and considerably enlarged. 840 pages, 486 illustrations, 94 tables, and indexes. From NAG Press Ltd., 226 Latymer Court, London W 6. 55s, post free.

PHYSICAL, CHEMICAL, & MECHANICAL PROPERTIES OF DIAMOND

A notable growth spiral on synthetic diamond

S. Tolansky. *Nature, Lond* 1961 Vol 190 (4780) p 992 June 10)

A few growth spirals have been observed only among one batch of General Electric (USA) crystals (1958). In a further batch (1960) no spirals were discovered. Amongst some De Beers microcrystal diamonds, recently examined, has been found, a spiral growth much more perfectly defined than any yet seen by the author; the step height is about 1300 Å, which is surprisingly large. 2 illustr, 1 ref.

E *Fh Uh.21*

Diamond grit, dressing tools and saw blades

Diamond Tool Research Co Inc, 580 Fifth Ave, New York 36. *Mod Mach Shop* 1961 Vol 33 (12) p 301 (May)

Diamond Tool Research Co Inc, exhibit a new type of natural diamond grit, pressure-tested diamond grits, and micron sized powders. It is claimed that these diamond structures are extremely blocky, longer lasting, and smoother cutting, and that, because of their uniformity, closer grading is possible. The diamond masonry and concrete saw blades feature both pressure-tested diamond grits as well as a tungsten carbide bond, which prevents the wearing away of the rim before the diamonds. The company also displays its new NR series of non-resettable and expendable diamond dressing tools.

B *Kl Nt/Nj*

Britain makes diamonds

National Physical Laboratory. *S Afr Min & Engng J* 1961 Vol 72 Pt 1 (3560) p 903 (Apr 28)

The first artificial industrial diamonds ever to be made in Britain were, it is stated, produced at the National Physical Laboratory early this year. Barely one-thousandth of an inch in diameter, they were produced under pressure from graphite and were by-products of a general investigation into the effects of ultra high pressures on various substances.

D *Fh Qc.321*

Gems made in water tub

Anon. *Daily Telegraph* 1961 (33,023) p 21 (June 21)

The process by which the General Electric Co produced artificial diamonds seemed over complex compared with a theory of Dr. E. Anders, Associate Professor of Chemistry at the University of Chicago. He had studied diamond bearing fragments from around the great meteor crater in Arizona and decided that they could have been formed by impact. This was contrary to the general belief that diamonds are formed only under the immense pressure created deep in the heart of some celestial body. On meeting another University of Chicago professor, ideas were exchanged that led to a method whereby graphite was compressed by an explosive charge over an open water barrel to make diamonds. Although these stones were extremely small, their manufacture was comparatively simple.

D *Fh Ha.21*

Advantages of and limits to diamond synthesis

Anon. *Diamant* 1961 Vol 4 (31) pp 25-26 (Apr-May) (In English, French and Flemish)

K *Ha.21*

Man-made or natural ?

Anon. *Amer Mach* 1960 pp 102-105 (Sep 19); *Pera Bull* 1961 Vol 14 (2) p 42 (Feb)

The case for man-made diamonds.

X *Fh.21*

X-ray study of linear compression of graphite at pressures of up to 16,000 kg/cm²

S. S. Kabalkina, L. F. Vereshchagin. *Dokl AN SSSR* 1960 Vol 131 (2) pp 300-302; *NLL Transl Bull* 1961 Vol 3 (6) p 526 (June) (Original in Russian)

D *Bhb Vhc.21*

Distinctive form of crystalline concretions of carbon

A. P. Sizov. *Zh prikl khim* 1957 Vol 30 (8) pp 1135-1141; *NLL Transl Bull* 1961 Vol 3 (6) p 532 (June) (Original in Russian)

D *Bhb Ubb.21*

Diamonds and diamond tools. Diamanten und Diamantwerkzeuge

Anon. *Klepzig Fachberichte* 1960 Vol 68 (6) pp 184-188 (June) (In German)

A general article which deals briefly with the structure and properties of diamond and goes on to survey the various applications of the diamonds in industry. They are widely used in engraving, especially in printing banknotes, where they help to avoid forgeries; in the engineering industry — grinding, lapping *etc*, and in cutting of stone, glass and ceramics. A mixture of diamond with non-diamond abrasives in a paste has proved economical for polishing sintered carbide dies. The article finishes by briefly mentioning the diamond synthesis. 13 illustr.

K *F U/Fh Ha/N.1451.25*

Coesite as an inclusion in G.E.C. synthetic diamonds

H. J. Milledge. *Nature, Lond* 1961 Vol 190 (4782) p 1181 (June 24)

In the course of X-ray diffraction work on synthetic diamonds many specimens were found to contain polycrystalline inclusions, the most prominent of which was identified, it is stated, as coesite. 7 ref.

D *Fh.131*

PHYSICAL, CHEMICAL, & MECHANICAL PROPERTIES OF HARD MATERIALS

Handbook for the identification of rocks. Handbuch zur Bestimmung der Gesteine

V. Rosicky, J. Kokta. *Buchneuerscheinungen aus den volksdemokratischen Ländern* 1961 (32) p 7 (July 10) (Original in Russian)

Book, NCSAV, 358 pp. Price DM 16.--

Contains various methods of identifying rocks including means of determining their physical and optical properties by means of the polarisation microscope.

[Not in library of Industrial Diamond Information Bureau].

K *Bn Ccb.21.33.52*

How Borazon is made

Anon. *New Sci* 1961 Vol 10 (241) p 803 (June 29)

If the economics of production of Borazon prove favourable, it could well have an application as an industrial abrasive, says the article. Borazon, a cubic form of boron nitride, whose relation to the normal hexagonal form is analogous to that of diamond to graphite, is as hard as diamond. (Details of the synthesis and some of the properties of the new material were given in the *J Chem Phys*, Vol 34 p 809).

D *F Unh*Re Unh*

When designing with ceramic materials
L. R. Larsen. *Prod Engng* 1961 Vol 32 (22) pp 47-51 (May 29)

Gives much useful advice on producing ceramic tools, including a table of properties, and three classes of application, refractory, electrical, and mechanical. Also mentioned is the fact that ceramics must often be ground with diamond abrasives. 2 tables.
E *Al Bl Chc Km/Pdd Qc*

Gear honing
Anon. *Tooling* 1961 Vol 15 (6) p 73 (June)

Composition of the gear hone is stated to be either silicon carbide or aluminium oxide bonded together with a plastics material. 1 illustr.
D *Ad Chh Pgk Rgc/Ad Chh Pgk Rjz*

Very dense Carborundum
Anon. *New Sci* 1961 Vol 10 (235) p 391 (May 18)

Carborundum compacts having densities as high as 98% of that theoretically attainable may be produced, it is claimed, by heating a powdered mixture of silicon carbide and boron under high pressure. This exceptionally hard, wear resistant material can be moulded into special shapes to form dies, nozzles and pump linings, it is stated. *D* *Qt:Rgc*

Silicon carbide. A high temperature semiconductor
J. R. O'Connor, J. Smiltens. *VDI Zeits* 1961 Vol 103 (19) p 864 (In English, review in German) (July 1)

Book, Pergamon Press, Oxford, London, New York, 1960, 540 pp. Price £4 10s.
[Not in library of Industrial Diamond Information Bureau]. *K* *Rgc Ued.52*

Gas etching and its effect on semiconductor surfaces
J. G. Gualtieri, M. J. Katz, G. A. Wolff. *Z Kristallogr* 1960 Vol 114 (1/2) pp 9-22 ; *Techn-Wiss Ber Osram* 1961 Vol 33 (12) p 471 (June 1) (Original in English, abstr in German)

Discusses the effect of etching diamond, silicon, and germanium crystals with halide and hydrogen halide.
K *Bde Ql Sz/F Ql Sz*

Highly oriented boron nitride
D. Belforti, S. Blum, B. Bovarnick. *Nature, Lond* 1961 Vol 190 (4779) p 901 (June 3)

Pyrolytic graphite deposited on a hot target has been found to have a structure with highly oriented crystallites. A boron nitride also possessing a high degree of orientation of its crystallites has now, it is claimed, been prepared by vapour phase pyrolysis and deposition on a hot target. 2 illustr, 3 ref.
D *Re.21*

DIAMOND, ETC, IN INSTRUMENTS

Grinding indicator shows when wheel contacts work
B. O. Morris, Ltd. *Canad Mach* 1961 Vol 72 (6) p 136 (June)

This electronic instrument is designed to show visually when a grinding wheel is in contact with the workpiece at times when the wheel itself is not visible. 1 illustr.
K *Chc Pr Wpz*

USP 2,950,617 (July 26, 1957) **W. J. Campbell**
Device for testing the abrasion-resistance of surfaces of metallic articles

The device is especially intended for testing hard anodic surfaces of articles of aluminium or of aluminium alloys. The surface is scored or scratched with a loaded stylus (diamond, sapphire, needle or pointed abrasive member) making a series of equi-spaced zig-zag scratches, *eg* 0.005 in. apart, the amount of material removed being a measure of the abrasion- or wear-resistance of the surface. Each series of scratches may consist of 20 or 30 scratches each about 0.05 to 0.125 in. in length. 2 claims, 2 illustr. Ref cited : 3 USP. *J* *Az Bf Cw Ungc.545*

HARDNESS, WEAR TESTING, AND PRECISION GAUGING

How hot hardness varies in tool steels
D. P. Hughes. *Metal Progr* 1961 Vol 79 (6) pp 76-79 (June)

Discusses tests made to determine the variations in the hardness of steel under heat. The device used was a small electric furnace on the elevating base of a standard Rockwell hardness tester. An external arm fitted to the machine's indenter and extending down into the furnace, conducts heat to the indenter and its diamond brake to warm them to the same temperature as the sample tested. The top of the furnace is sealed from the air so that it can retain a protective atmosphere. 5 illustr, 1 table.
K *Bfcb Cvd Nd Unhcd.1312.21*

Testing the hardness of oxide-ceramic cutting materials at high temperatures. Häteprüfung von oxydkeramischen Schneidstoffen bei hohen Temperaturen
E. Lenz. *Masch Markt* 1960 Vol 66 (49) pp 47-49 ; *Techn-Wiss Ber Osram* 1961 Vol 33 (12) p 459 (June 1) (In German)

Describes a new method of hardness testing by means of grinding. A grinding wheel with a predetermined peripheral speed and load is applied to the testpiece for a specified period. The length of the groove formed is in direct relationship with the hardness of the material examined. *K* *Chc Unh Vfd*

An appliance for checking deep holes during grinding
P. A. Dedyanin, E. I. Rybakevich, A. A. Timm. *Machines & Tooling* 1960 Vol 31 (12) pp 28-31 (Dec) (Original in Russian)

This appliance has been designed for the Russian KhSh-83 internal grinding machine to check holes 10.660 to 11.417 in. in depth and up to 55.718 in. in depth in such workpieces as cylinders. 8 illustr.
D *Chc Pr:Az Qd W*

Optical measuring of external diameters. Optisches Messen von Aussendurchmessern
M. Hensoldt & Söhne, Wetzlar. *Feinwerktechnik* 196[illegible] Vol 65 (6) p 229 (June) (In German)

A new instrument shown at the Hanover Machine Tool Exhibition works on an entirely new principle, can measure the external diameter of stationary or rotating workpieces, and is accurate to 0.0005 mm with workpieces of 25 to 160 millimetres.
K *Wbz.27.32?*

Achema Preview—Achema Vorschau

13th Achema in Frankfurt on Main 9th to 17th June, 1961. Zur 13. Achema in Frankfurt/Main von 9. bis 17. Juni 1961. *Sprechsaal* 1961 Vol 94 (11) pp 286-297 (June 5) (In German)

Among new developments to be shown at the Fair are the machine projector and interference-surface tester produced by Ernst Leitz GmbH of Wetzlar. The first device is for controlling the profile on machine tools, including grinding machines and milling machines. Enlargement is 10X, 20X, 30X or 50X. The second instrument is intended for examining surfaces whose roughness cannot be tested by other means and is for use with white or monochromatic light (0.55 μ). 8 illustr.

K *Chc Pr Psf Wp.27.322/Wgf.27.322*

Studies of abrasive wear resistance

National Engineering Laboratory. *Engineering, Lond* 1961 Vol 191 pp 546-547 (Apr 14); *Bull Brit non-ferr Met Res Assoc* 1961 Vol 41 (383) p 246 (June)

Report on the work of the Laboratory's Lubrication and Wear Division. Types of abrasive wear, significance of hardness, 3 basic types and laboratory wear machine (Brinel, spinning rod and pin-on-disk), interpretation of data (plot of relative wear-resistance vs hardness shows distinct pattern of behaviour for various metals).

X *Ba Unr.21*

The application of optical measuring and testing devices to the clock making industry. Die Anwendung optischer Mess- und Prüfgeräte in der Uhrenindustrie

A. Metz. *Dtsch Uhrmacher Zeits* 1961 Vol 65 (6) pp 228-229 (June) (In German)

Hardness testing is one of the most important testing operations in the clock making industry. For testing small parts miniature hardness testers, such as the Durimet, using four-sided diamond pyramids and with a load of 15 to 500 grams. With this instrument the measuring of the diagonal of the impression is carried out under a strong microscope. 4 illustr.

K *Az Cvd Nde Wghc*

Hardness-tensile strength conversion for Rockwell hardness, C scale

Anon. *Materials, Research & Standards* 1961 Vol 1 (6) pp 448-451 (June)

Discusses the efforts of a task group composed of members of ASTM, SAE the government, and industry to resolve the hardness-tensile strength relationship of steel treated above Rockwell hardness C 40. 7 illustr, 4 tables. *K* *Bfcb Unhcd* Bfcb Unlc*

Checking and measuring gear wheels. Aufgaben und Verfahren der Prüftechnik beim Messen und Prüfen von Zahnrädern

K. H. Weber. *Industrieblatt* 1961 Vol 61 (6) pp 399-404 (June) (In German)

The article reviews the problems involved in checking the accuracy of gear wheels, and the devices used, with special reference to the universal gear wheel checking device, which, with the aid of interchangeable components can measure various different types of gear wheels. 12 illustr, 5 ref. *B* *Ad Qd Wb*

Grind-A-Lap features quick change ring-type wheels

Leonard Precision Products Co (Grind-A-Lap Div) 9200 Bolsa Ave, Santa Ana, Calif. *Cutting Tool Engng* 1961 Vol 13 (5) p 29 (May)

An adjusting mechanism built into the grinding wheel dresser arm is connected directly to the diamond holder. It permits adjustments finer than 1/10,000 inch. 1 illustr.

W *Chc Pr:Nj Psf Psc*

The Talysurf precision measurement with the aid of a diamond. Mesure de précision grace au diamant sur le ' Talysurf '

Taylor, Taylor & Hobson. *Mach Mod* 1961 Vol 55 (628) pp 61, 63 (July) (In French)

The Talysurf 105, a new surface measuring device uses an industrial diamond, thus combining exceptional resistance to wear and great sensitivity; it can measure irregularities on the interior diameter of cylinders from 279 mm to 6.3 millimetres. 1 illustr.

B *Nd Wgf*

' Portable ' hardness tester

Metallurgical Services (Planned Products (Metallurgy) Limited). *Met Ind, Lond* 1961 Vol 98 (25) p 502 (June 23)

This unit, which is of American origin has a preloaded diamond indenter. To make a test the handgrips are simply pressed towards the specimen. The movement of the indenter as it penetrates compresses a diaphragm hydraulically, forcing fluid into a capillary tube, and readings are based on the displacement of the fluid.

K *Cvd Nd Prw*

Optical measuring instruments help series production. Optische Messgeräte als Hilfsmittel des Serienbaus

G. Franke. *Techn Zbl prakt Metallbearb* 1960 Vol 54 (6) pp 274-279; *Techn-Wiss Ber Osram* 1961 Vol 33 (12) p 459 (June 1) (In German)

K *Ceq Wcz*

Interference methods for measuring surface roughness

G. Trumpold. *Measurement Tech* 1960 (2) pp 159-165 (Feb); *Instrum Abstr* 1961 Vol 16 (6) p 497 (June)

The use of interferometric methods in production conditions is discussed.

D *Unf Vs.1451*

TRUING OF GRINDING WHEELS

Adjustable wheel dresser ends bringing wheel down to diamond

Eastern Machine & Tool Co 170 Broadway, New York 38, NY. *Amer Mach* 1961 Vol 105 (10) p 185 (May 15)

Adjustable from 2¼ to 8 in. above magnetic chuck or table of machine, the Hi-Lo dresser has three supporting arms claimed to give extra rigidity and keep the diamond in position without using a C-clamp. 1 illustr.

D *Cg Nj Psf*

Japanese machine tool factories—10

R. E. Green. *Machinery, Lond* 1961 Vol 98 (2533) pp 1229-1236 (May 31)

Equipment employed in the manufacture of Makino machine tools is described in detail where of interest, as are the products of this company. The wheel of a Toyoda-Gendron centre-hole grinding machine is dressed to the required angle automatically, by an attachment which incorporates a slide with a diamond holder, spring-loaded towards the wheel. The spindle quill has a mounting for a cam with a straight edge, the angle of which can be set with the aid of a scale. As the spindle is fed down, the diamond is moved radially outwards to reproduce the angle of the cam on the wheel. The position of the diamond relative to the wheel is adjusted by means of a knurled screw. 11 illustr. *D* *Chc Psf:Nj.373*

J & S diamond dresser designed to dress internal, external wheels

J & S Tool Co Inc, 87 Dorsa Ave, Livington, NJ. *Amer Mach* 1961 Vol 105 (10) p 180 (May 15)

Model RFG 650A has adjustable diamond height and two holders for the diamonds. 12 in. diameter wheels are recommended as a maximum and the dresser is primarily intended for universal grinders. 1 illustr.

D *Ab Cg Nj Psf*

Block diamond wheel dresser handles wheels to 48-in. dia.

Lazzara Co. *Amer Mach* 1961 Vol 105 (11) p 103 (May 29)

The design incorporates 150 octahedrons set in tungsten powders for tough gripping action around the stones. The face measures $\frac{1}{4} \times \frac{3}{8}$ in. and 7/16 in. deep with alternative layers of 21 and 22 diamonds. This tool, which can dress wheels from 12 to 48 in. diameter, is guaranteed to outwear a 2 ct. diamond wheel dresser, and, it is claimed, can be used on machines for every type of grinding, dry or wet. 1 illustr.

E *Ab Cg Nje Psf*

Adjustment compensates for diamond tool wear

Briney Mfg Co. *Mach Tool Blue Bk* 1961 Vol 56 (6) pp 230-231 (June)

An adjusting control over diamond point wear in grinding wheel dressing and relating machinery applications is now available. It allows adjustments in 1/10,000 in. without loosening or tightening any screws. 1 illustr. *K* *Ab Cg Nj Unr Wp*

Adjustable wheel dresser reduces truing time

A. B. Craley & Son. *Mach Tool Blue Bk* 1961 Vol 56 (6) pp 250-251 (June)

An adjustable grinding wheel dresser, the Accra-Set, reduces wheel-truing time by minimising vertical hand wheel motion during the truing process. It consists of a housing, mounted at the end of a magnetic chuck, a spring actuated mount for the diamond, and a lock screw. *K* *Ab Cg Nj Psf*

Adaptation of a centreless grinder for formed work

F. E. Payne. *Machinery, Lond* 1961 Vol 98 (2532) pp 1182-1183 (May 24)

A simple form-truing attachment fitted to a plain centreless grinder permits the production of shaped components, *eg* a waisted stud. The truing apparatus consists of a diamond projecting from an arm pivoted to a bracket, the bracket being attached by screws to the existing truing arm of the machine. A ball stylus below the arm engages the template which is mounted in place of the normal work rest, and contact between stud and template is maintained by means of a spring. The setting-up and operation of the attachment are described. 2 illustr.

W *Chcc Pr Psfz:Njb*

The quantity production of poppet valves (cont)

R. E. Green. *Machinery, Lond* 1961 Vol 98 (2534) pp 1276-1284 (June 7)

Methods employed for this operation by Vauxhall Motors Ltd are described in detail. Finish-grinding operations on valve seats are said to be fully automatic, including dressing of the grinding wheel. During dressing the diamond, in the unit above the wheel, is advanced by 0.0015 in. for each of two passes. A special plunge-grinding machine for collett grooves has two dressing diamonds, one for each corner, carried on a slide at the rear of the wheel, and their movements during the automatic dressing cycle are controlled by cams. This dressing cycle, which occupies about 30 sec it is stated, is described. 10 illustr.

D *Az Chcd Pr:Nj Psf/Az Chct Pr:Nj Psf*

Habit spherical and radius turning attachment

Habit Diamond Tooling Ltd, Lurgan Ave, London W 6. *Mach Shop Mag* 1961 Vol 22 (6) p 362 (June)

A compact spherical and radius turning attachment, suitable for clamping in the toolpost of a lathe or shaping machine, has been developed. The equipment is suitable for producing convex radii up to $\frac{3}{4}$ in. or concave radii up to $2\frac{1}{2}$ inches. 1 illustr.

B *Ceqb Pr Psc*

Automatic internal and face grinding machine

Churchill Machine Tool Co Ltd, Broadheath, Manchester. *Tooling* 1961 Vol 15 (7) pp 56-57 (July)

The latest Churchill Model HBM automatic internal grinder is fitted with an ingenious automatic facing device, by means of which an external face is ground square with the bore of the component, both operations being carried out automatically. The truing diamond is arranged so that the facing wheel is dressed with a relief to reduce the contact area with the work, and to provide a cutting edge. 1 illustr.

K *Chcn Prs Pscz/Chcn Prs Psf:Njb*

Lapping machine and dressers

J & S Tool Co Inc, 871 Dorsa Ave, Livingston, NJ. *Mod Mach Shop* 1961 Vol 33 (12) pp 247-249 (May)

The Model L 2 small centre lapping machine will lap both centres simultaneously in pieces 7-8 in. long, from 1/16 to $\frac{1}{4}$ in. diameter at a highly increased rate of production, and the Model 'RFG 650 A', a dresser with adjustable diamond height, and two holders for the diamonds. This latter machine is for use primarily on universal grinders, where the dresser must be mounted on a solid angle ramp, and both the external and internal grinding wheels must be dressed. Also shown is the 'Fluidmotion' wheel guard dresser, adaptable to spindle housings 3-$3\frac{1}{2}$ in. diameter, and to wheels of 7 or 8 in. diameter, which features an inverted base with compound micrometer for maintaining position of a formed grinding wheel in relation to the work. 2 illustr.

B *Cg Nj Psf/Chd Pr*

Dressing a large radius grinding wheel

Anon. *Tooling* 1961 Vol 15 (7) p 62 (July)

Describes an improvised set-up for dressing a large radius when grinding a crown face or hardened steeel rollers. 3 illustr. *K* *Ab Cg Psfc*

Hanover Trade Fair : Diamond tools. Deutsche Industriemesse Hannover 1961 : Diamantwerkzeuge

Anon. *Metalloberfläche* 1961 Vol 15 (7) p 220 (July) (In German)

Ernst Winter & Sohn of Hamburg displayed a large selection of diamond tools, containing many improvements and innovations. New methods of production and bonding the K-plus diamond grinding wheels have led to tool life being increased by 200-300 per cent. The Winter-Flex-diamonds for dressing small diameter ceramic grinding wheels prevent vibration of the grinding wheel during the process. The Winter 'Rondist' diamond dresser is designed for the profiling of grinding wheels. The Winter 'Diamant-Igel' has replaced large diamonds for dressing grinding wheels, since it is less sensitive and considerably cheaper. A further development is the Winter Diamond Insert which costs much less than a profile diamond, and can be used continuously without resetting. The equally new Winter Pro-Dress-Diamant is intended for the dressing of hard, fine-grained grinding wheels and thread grinding wheels, and has a considerably increased life. *B* *N.27.32*

The Model ZP451 semi-automatic spline grinding machine

Anon. *Machines & Tooling* 1960 Vol 31 (12) p 37 (Dec)

The automatic cycle of the machine includes dressing once/work piece revolution with adjustment of feed to compensate. Dressing of the grinding wheel profile is done automatically with three diamonds working simultaneously. *D Chc Pr:Njd Psf*

PLS-10 surface grinder

Gate Machinery Co Ltd. *Metalworking Prod* 1961 Vol 105 (22) p 65 (May 31)

Grinding surface area width is 6 in. and length 8 in. on this Nyberg and Westerberg hydraulic surface grinder. Longitudinal travel of the work table is steplessly variable from 3 to 40 ft/min, and cross feed can be hand operated or automatic with adjustable feed variable between 0.0056 and 0.028 in. per stroke in 0.002 in. graduations. Built-in diamond dressing and wet grinding attachment are supplied as standard equipment. 1 illustr.
D Chcm Prsc:Nj Psf

40 factors affecting truing. 40 facteurs agissant sur la rectification

E. C. Enos. *Mach Mod* 1961 Vol 55 (628) pp 45-48 (July) (In French)

A general treatment of the various materials and methods used for truing and dressing.
B Cg.21

Special automatic grinder. Automatische Spezial-Schleifmaschine

Anon. *Der Maschinenmarkt* 1961 Vol 67 (14, F) pp 42-43 (July 7)

This machine, designed for the economical manufacture of special rotating milling tools (files) in tungsten carbide, is fitted with an automatic truing device which in conjunction with the large diameter of the diamond grinding wheel is claimed to give a very fine surface finish economically. 1 illustr.
K Alcz Bkcb Chc Nv Pr Psfz

Karstens cylindrical grinder. Karstens-Rundschleifmaschine

Anon. *Maschinenwelt u Elektrotechnik* 1961 Vol 16 (7) p 321 (July) (In German)

The rigid construction of the Karstens precision cylindrical grinders makes it suitable for jobs where a high degree of accuracy is required. Of special note is the hydraulic copy truing device, which is used for profiling the wheels for workpieces which are ground simultaneously in two or three places. Truing can be carried out while the workpiece is being changed. 1 illustr. *K Chcl Pr Psfb*

German Industries Fair 1961. Deutsche Industriemesse 1961

Anon. *Industrie-Anzeiger* 1961 Vol 83 (51) pp 887-947 (June 27) (In German)

General survey of the machines and equipment shown at the Fair. Of special interest are the 'Tatar' twist drill grinder by P. W. Weidling & Sohn KG of Münster, which can grind drill bits of 0.3 to 15 mm in diameter; the FKP 500 edge-grinder by Gebr Schmid of Freudenstadt, and the diamond-impregnated inserts produced by Ernst Winter & Sohn of Hamburg and are intended for the profile truing of grinding wheels on cylindrical grinders, centreless cylindrical grinders and plane grinders. The large number of small diamonds working simultaneously on the grinding wheel, produce a perfectly even surface.
K Ab Cgf Njd Pr.27.322

Centreless grinding

Hartex GmbH, Berlin, Brit rep: Rockwell Machine Tool Co Ltd, London NW 2. *Mech World* 1961 Vol 141 (3503) p 218 (June)

Hydraulically operated diamond dressers mounted over both wheels are one feature of two new centreless grinding machines, Models BED 4 and BED 5. A special Hartex balancing device facilitates balancing the grinding wheel on the machine spindle during operation, thus enabling, it is claimed, the constantly changing conditions of balance due to wheel wear and dressing to be compensated without any delay in production. 1 illustr. *D Chcc Prsc:Nj Psf*

The quantity production of poppet valves

R. E. Green. *Machinery, Lond* 1961 Vol 98 (2532) pp 1164-1174 (May 24)

One operation involves semi-finishing of valve stems to 0.346/0.347 in. on a Landis centreless grinder. The control wheel is diamond dressed under manual control to the required cam form, the diamond being held in a cam-controlled slide mounted on a support plate pivoted above the wheel housing. The diamond is hydraulically fed past the wheel, while the support plate for the dresser slide is raised and lowered by a cam on the wheel spindle. The grinding wheel also has a hydraulically-operated dressing slide; this is brought into use automatically after a pre-set number of valves has been ground. At each dressing cycle the diamond is lowered 0.0015 in. and traversed across the wheel, being lowered a similar amount for the return stroke. 13 illustr. *W Az Chcc Pr Psfb:Nj*

Swiss P 347,411 **S. G. Brady, Ex-Cell-O Corp**
(June 25, 1956—USA)

Machine for truing a grinding wheel. Machine pour rectifier une meule

This machine resembles the mechanism described in Swiss P 340,399 (see abstr made previously in Aug 60). In this earlier mechanism the truing diamonds are actuated by hydraulic motors which are, however, never absolutely reliable. To make it quite impossible that the diamonds come too near together, the controlling pantographs are connected in such a way that the follower rolls travelling under spring pressure along their respective templates can move freely but within certain limits with regard to any movement towards each other. 3 claims, 3 illustr.
J Ab Cg Nj Psf.545

DAS 1,086,582 **Ges der Ludw von Roll-schen Eisenwerke AG**
(Aug 11, 1953—Switzerland)

Truing device for grinding wheels of a surface grinding machine, in particular for grinding slideways. Abdreheinrichtung für Schleifscheiben an einer Flächenschleifmaschine, insbesondere an einer Führungsbahnschleifmaschine

The grinding wheel is supported on a member oscillable about a pivot. The truing diamond is arranged on a cross slide at the end of an oscillable arm whose other end is pivotably around an axis in the oscillable member in a plane connecting the axes of oscillation and of the grinding wheel. The pivotable arm can be swung about at least 90° from its operative position in the plane of the grinding wheel into inoperative position outside the path of the workpiece. 4 claims, 7 illustr. Ref cited: 4 GP; 1 FP; 1 BP; 2 USP. *J Ab Cg Nj:Chcm Pr.545*

LITERATURE REQUESTS
Please quote the page number of the journal which contains the original reference, and the author and title of the article, in all cases.

PRECISION MACHINING OF METALS

Portable fine boring machine

Buma Engineering Co Ltd. *Times Review of Industry* 1961 Vol 15 (173) p 96 (June)

Designed for fine boring the driving bores in coupling flanges for large diameter shafts *in situ*, this machine uses a tungsten carbide tipped cutting tool sharpened by an attached diamond impregnated grinding wheel. A special micrometer, provided for setting the cutting diameter of the tool and jigs ensures, it is claimed, that correct cutting angles are formed on the tool by the diamond wheel. *D* *Al Bkc Chc Nv*

Cut tool life and boost savings ?

R. D. Zimmerman. *Amer Mach* 1961 Vol 105 (10) pp 127-129 (May 15)

Sintered carbide inserts have made possible great savings in tool and machining costs because, it is stated, machine speeds can be increased and the overall cost of inserts against production is less than that of conventional tools. Also no equipment is needed for resharpening or rebrazing. 4 tables.
D *Ceg Pdcb.1451*

Portable boring machine for flange drilling

Anon. *S Afr Min Engng J* 1961 Vol 72 Pt 1 (3563) p 1141 (May 19)

Known as Model FM, this machine is specifically designed for finish-boring holes in coupling flanges. The cutter is of tungsten carbide and sharpening is carried out on a built-in metal bonded diamond wheel.
B *Cfd Pdc Pr:Nv*

Internal grinder for miniature work

Heald Machine Co. *Mach Tool Blue Bk* 1961 Vol 56 (6) p 182 (June)

This latest development has an incremental wheel compensation range of 0 to 0.001 in. as opposed to 0.0001 to 0.001 in. on older models. Designed primarily for work on anti-friction bearings, this model 090A is said to improve wheel life to 1,000 or more pieces/wheel. 1 illustr. *K* *Ayz Chcn Pr*

Machining cylinder blocks on a sectional transfer machine

Anon. *Mach Shop Mag* 1961 Vol 22 (7) pp 401-405 (July)

6 illustr. *K* *Ag Ceq Pr*

Some machining operations on the new Hoover Keymatic washing machine

Anon. *Mach Shop Mag* 1961 Vol 22 (7) pp 384-393 (July)

19 illustr. *K* *Az Ceq.1456*

Russian machine tools at the Leipzig Fair

R. E. Green. *Machinery, Lond* 1961 Vol 98 (2533) pp 1251-1259 (May 31)

Among the machine tools described are several milling machines and a vertical copy-milling machine with punched tape programme control. 13 illustr.
D *Cff Pr.33:.27.322*

Russian automatic transfer machines at the Leipzig Fair

R. E. Green. *Machinery, Lond* 1961 Vol 98 (2534) pp 1293-1302 (June 7)

One of the machines, for milling, drilling, counterboring, boring, facing and tapping operations on aluminium alloy oil filter housings is described. Cycle time is 1 minute. 11 illustr.
D *Az Bfxc Cfb Pr.33:.27.322/Az Bfxc Cfd Pr.33:.27.322/Az Bfxc Cff Pr.33:.27.322*

Theory of metal cutting

P. H. Black. *Bull Brit non-ferr Met Res Assoc* 1961 Vol 41 (384) p 297 (July)

Book, McGraw-Hill Book Co, New York and London. 1961, 204 pp. Price £2 18s.

Chapters on cutting tools, tool life, grinding, three dimensional cutting, electrolytic and ultrasonic machining included.

[Not in library of Industrial Diamond Information Bureau]. *D* *Bf Ceg Pd.21.52/Uqe.21.52*

High speed machining — the answer to low cost production of non-ferrous metal parts

Anon. *Mod Mach Shop* 1961 Vol 33 (12) pp 122-125 (May)

High speed machining is defined as a process in which cutter speeds from 5,000 to 10,000 surface ft/min are employed, for which spindle speeds from 1800 rev/min to 100,000 rev/min are required. A high speed cutter can be designed to provide cutter-life equal to, or better than, the cutter for conventional speeds. Heat is not a great problem when machining aluminium, since it is removed almost as fast as it is generated. A large volume of coolant is not required. 3 illustr.
B *Bf Ceq Pd Uqf*

Precision Engineering in Hong Kong

V. Wolpert. *Tooling* 1961 Vol 15 (7) pp 37, 39 (July)

2 illustr. *K* *Ceqz.372*

The evaluation of gear cutters in the machining of gear wheels, III. Berechnung von Hobelkämmen für die Zahnradfertigung, III

J. Looman. *Industrieblatt* 1961 Vol 61 (6) pp 344-354 (June) (In German)

The article gives a list of defects, which is intended to serve as a guide, in defining gear-cutter tolerances, and to indicate in advance the faults in the finished gear-wheel which might be expected when using a faulty gear-cutter. Diagrams illustrate the conclusions. 22 illustr, 3 tables. *B* *Ad Ceg.21*

Special turning tools for cutting and grooving cylinders. Sonderdrehmeissel zum Ein- und Abstechen von Rohren

Anon. *Industrieblatt* 1961 Vol 61 (6) p 394 (June) (In German)

A description is given of a special two-cutter tool for cutting grooves in tubes and cylinders. 1 illustr.
B *Ag Cegd Pd*

Less expense through better cutting fluids. Niedrigerer Aufwand durch bessere Schneidflüssigkeiten

P. W. Sherwood. *Schmiertechnik* 1961 Vol 8 (3) pp 133-134 (May-June) (In German)

High surface quality, fine tolerances and high output per hour are to a large extent dependent on efficient dissipation of the heat produced. Recently coolants which can be emulsified with water and coolants which are soluble in water have been of increasing importance. Requirements and properties are discussed. 4 ref.
K *Ceg Sjk U*

Side-lights of the Leipzig Spring Fair 1961. Streiflichter von der Leipziger Frühjahrsmesse 1961

E. Fischer. *Feinwerktechnik* 1961 Vol 65 (6) pp 217-222 (June) (In German)

Diamant Boart of Brussels displayed their latest products in the field of diamond tools for precision machining. 24 illustr.
K *Ceqz N.3235:.27.32*

Perkins assess throw-away tooling

W. A. Hawkins. *Metalworking Prod* 1961 Vol 105 (26) pp 49-52 (June 28)

The Eastfield, Peterborough works of F. Perkins Ltd have decided to replace brazed tools wherever possible throughout the factory. Their experience, however, leads them to the conclusion that brazed tools cannot be replaced entirely. The article gives details and figures. 3 illustr, 3 tables.

K *Pdc*Pdch*

Russian machine tools prominent at Earls Court

Anon. *Metalworking Prod* 1961 Vol 105 (27) p 15 (July 5)

Between ten and twelve Russian-built major machine tools make their début at Earls Court. They are considered to be of good modern design, but without any noteworthy innovations. 1 illustr.

B *Pr.33:.27*

Fundamentals of economic manufacture—23

W. F. Walker. *Tooling* 1961 Vol 15 (6) pp 37-43, 46-49 (June)

The article outlines the factors that should be considered when attempting to assess the economical removal of component metal. Types of cutters applicable to the main types of milling operation are described from the point of view of design. In a paragraph on cutter materials it is stated that milling cutters with inserted teeth of high speed steel and with brazed-on tips of stellite and sintered carbide are becoming more widely used. 7 tables, 10 illustr.

D *Cff Pd.256*

Swiss P 347,409 **C. Eisele, A. Eisele Chr. Eisele KG Maschinenfabrik**

(Aug 4, 1956—Germany)

Circular metal saw. Metallkreissäge

8 claims, 5 illustr. *M* *Pc.545*

CUTTING AND MACHINING OF STONE, GLASS, ETC.

Closer look at fibreglass-reinforced thermoplastics

W. H. Chadbourne. *Prod Engng* 1961 Vol 32 (20) pp 95-97 (May 15)

The great improvement in the physical properties of four common thermoplastics when reinforced by glass fibres is illustrated by a comprehensive table. It is stated that other polymers do not receive the same broad improvements in their properties on reinforcement, as these four : polyamide (nylon 66), polystyrene, styrene-acrylonitrile and polycarbonate. For secondary finishing operations of prototype parts which should, it is stated, be produced in single cavity moulds wherever possible, carbide tipped tools should be used. 4 illustr, 1 table.

D *Bpz Uc/Bpz Chm Pdcb*

Diamond-coated bandsaws cut carbides

Anon. *Metalworking Prod* 1961 Vol 105 (23) p 63 (June 7)

Steel bandsaw blades with diamonds bonded along the cutting edge can be used on standard band sawing machines for contouring cuts in hard materials, such as carbide, glass, reinforced plastics, and ceramics, it is claimed. 2 illustr.

D *Bk Ceg Nt Pr/Bl Ceg Nt Pr/Bm Ceg Nt Pr*

Conference on grinding and polishing glass and other britt.e materials

A. S. Totesh, T. A. Makarova. *Stek i ker* 1961 Vol 18 (1) pp 45-47 (Jan) ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (1) p 131 (Apr)

E *Bm Chc.231/Bm Chm.231*

Grinding of samples for analysis

P. Draignaud. *Bull Soc franc Ceram* 1959 (44) p 71 (CSIRO 5131) ; *Insdoc List* 1961 Vol 8 (9) p 725 (May 1)

E *Az Chc*

Autoflow in Moscow

Autoflow Engineering Ltd, Rugby. *Mfg Opt* 1961 Vol 14 (8) p 371 (May)

'Diagrit' diamond impregnated grinding and cutting tools were amongst the wide range of optical and glass working machinery exhibited by Autoflow Engineering Ltd of Rugby. The 'Diagrit' diamond impregnated tools displayed at the Moscow Trade Fair had sintered metal, resinoid and electro-metallic bondings.

D *Ceg Ng.321:.27.33/Chc Nv.321:.27.33*

BP 842,989 **G. Lefèvre, Soc Mo No Cor**

(Nov 2, 1955—France)

Machine for drilling small stones

A series of vertical spindles are arranged around a rotatable vertical turret. Under each of the spindles is positioned a series of rocking members for holding a stone to be drilled. Upon completion of the drilling procedure, a switch is closed by each rocking member energizing the motor controlling the turret. When the spindle carrying the drilled stone registers with the point of loading the stones into the machine, a second circuit stops the motor and then locks the turret in position. 8 claims, 27 illustr.

J *Bb Cfb Pr Tc.545*

BP 845,572 (Mar 20, 1957) **H. C. Davis, Autoflow Engng Ltd**

Grinding machines, particularly for edge-grinding ophthalmic lenses

The machine is particularly intended for grinding the V-edges of ophthalmic lenses. Two types of grinding wheel are in common use, a carborundum wheel and a diamond wheel. As a diamond wheel grinds faster but leaves a "starred" edge it is customary to finish-grind the edges on a carborundum wheel. The machine operates with a rough-grinding diamond wheel having a peripheral speed of 5,500 to 7,000 ft/min and a finish-grinding carborundum wheel having a speed of 2,000 ft/min arranged side-by-side. The wheels have different diameters and their centres are laterally off-set so that both operate on a common tangential plane. 5 claims, 2 illustr.

J *Az Bm Chcs Nv Pr.545*

FP 1,227,965 **V.I.S. (Vetro Italiano di Sicurezza Spaz)**

(June 26, 1958—Italy)

Automatic machine for grinding glass, in particular large series of automobile wind screens or the like. Machine automatique pour le meulage des glaces, notamment pour la fabrication en grande série de glaces d'automobiles ou analogues

The periphery of the cut sheet is ground by a diamond wheel with a grooved profile. The sheet is positioned on a table lifted to the plane of operation, its position being corrected by a template. The sheet is then fixed and the grinding proceeded with. Afterwards the sheet is detached and removed. All movements are completely automatic. 10 claims, 8 illustr.

J *Bm Chc Thz.545*

BP 863,113 **Compagnie de Saint-Gobain** (Nov 10 ,1958—France)

Improvements in or relating to mountings for glass cutting tools

During the cutting operation the cutting tool is applied to the glass under pressure transmitted to the tool from a jack by a spring interposed between the jack and the tool and acting as a shock absorber. The device illustrated in Fig 1 comprises a cylinder and piston assembly 1, 2, a rod 21 adapted to slide freely within the piston rod 11 and a spring 3 engaged between abutments provided one on each rod. Air is admitted to the cylinder 1 through apertures 5, 6. A sensing mechanism including a microswitch 45, Fig 2, connects the rod 21 to a diamond cutting tool 4a by means of a sleeve 32 and controls air supply to the apertures 5, 6 and hence the position of the tool relative to the glass surface. 8 claims, 5 illustr.

H *F Ld Ncb.545/Pds Qc.545*

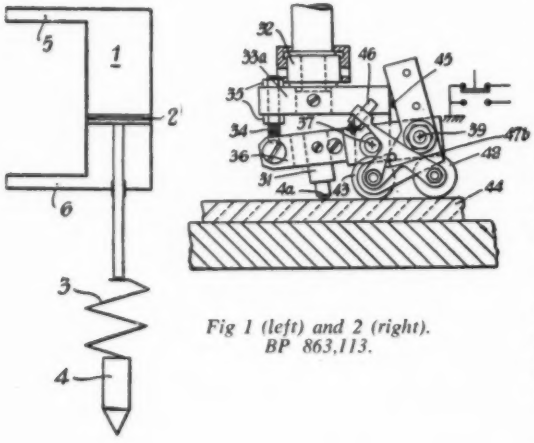


Fig 1 (left) and 2 (right). BP 863,113.

GEM POLISHING

GJ's quick course in gemmology Part 2 : The true colour of a gem

Anon. *Goldsmiths J* 1961 Vol 67 (508) pp 252-254 (June)

The colour of a gem is dependent on the light which falls on it, therefore it is stressed that it should be examined in pure white light, preferably white daylight. 5 illustr. *D* *Bb.21*

Exhibition for suppliers of tools and equipment to the jewellers, gold and silvermith's trade. Ausstellung der Zulieferer für das Juwelier-, Gold- und Silberschmiedehandwerk

Anon. *Dtsch Goldschmiede Ztg* 1961 Vol 59 (7) pp 408-410 (July) (In German)

Samuel Gassan, diamond cutters of Amsterdam and Düsseldorf displayed several complete workbenches from their cutting workshops and gave complete information on all technical aspects of the trade, while on the Oskar Leiber stand a new kind of electric diamond scales was shown. 7 illustr.

K *F Hj Jz.27/F Hl Jg.27*

The pattern in a gemstone

Anon. *Goldsmiths J* 1961 Vol 67 (508) pp 254-256 (June)

Basic crystal structures are described and examples given of gems which fall into these categories. 10 illustr. To be cont. *D* *Bb Vh.21*

ROCK DRILLING

Project Mohole demonstrates water drilling techniques

G. M. Wilson. *World Oil* 1961 Vol 152 (7) pp 84-90 (June)

Describes the successful completion of the first stage in Project Mohole, the ultimate aim of which is to drill in water 18,000 ft. deep through a depth of perhaps 15,000 ft. of rock to the earth's mantle. In 11,700 ft. of water in open ocean between Guadalupe Island and the Baja California coast, six holes were drilled, the deepest being 601 ft. The 9 in. diamond bit selected was designed around a 6¾ in. OD outer assembly which would receive several combinations of inner assemblies, and had to be suitable for formations ranging from clay to hard volcanic basalt. 12 illustr.

D *Bnt Cfb Nhb*

Deep well drilling rigs

G. B. Karapetian, S. V. Zvorykin. *Book Moskva, Gos nauchno-tekhn izd-vo mashinostroit lit-ry.* 367 pp; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (1) p 186 (Apr)

[Not in library of Industrial Diamond Information Bureau]. *E* *Cfb Pl*

Economics of slim and slimmer well drilling

O. B. Koposova. *Book* 1960 *Moskva, Gos nauchno-tekhn izd-vo neft i gorno-toplivnoi lit-ry.* 46 pp; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (1) p 186 (Apr)

[Not in library of Industrial Diamond Information Bureau]. *A* *Cfbs.145*

The world-wide development of the petroleum industry. Die globale Entwicklung der Erdölindustrie

H. Pöll. *Erdöl Zeits* 1961 Vol 77 (4) pp 121-128 (Apr) (In German)

Historical survey of the oil industry in which the introduction of rotary drills is mentioned. 20 illustr.

K *Cb Plz.21*

'W' Group drill rods cut diamond core drilling costs

R. E. Davies. *Engng & Min J* 1961 Vol 162 (6) p 106 (June)

'W' group rods are a new group of four sizes of diamond core drill rods — EW, AW, BW and NW, designed to be used with EX, AX, BX and NX diamond bits and equipment. Advantages claimed include increased rigidity, reduced vibration, improved flow of drilling fluid, and quicker coupling and uncoupling.

K *Cfb Nhe Plkz*

Largest diamond drill bit made in Australia

Diamond & Boart Products (Australia) Pty. *Diamond News* 1961 Vol 24 (8) p 35 (May)

The Department of Mines in South Australia has taken delivery of the largest diamond drill bit ever made in Australia. The 18 in. diameter bit cuts a 9/16 in. kerf and contains 200 ct (3,000 stones) of diamond. It will be used for drilling 8 ft deep holes in exceptionally hard granite beneath 25 ft of water in Port Lincoln Harbour. 1 illustr. *W* *Nhb.38*

From the field : Broken Hill South Ltd creates Australian diamond drilling depth record

Anon. *'Mindrill' Bits & Pieces* 1961 Vol 14 (3) p 5 (Mar)

A record hole of 6,402 ft was recently completed using a Mindrill F 100 drill with a rated capacity of 5,000 ft BX size, and rods used were a combination of B and BW. *D* *Nh.12.38*

The International Construction Equipment Exhibition

The Consolidated Pneumatic Tool Co Ltd. *Min J* 1961 Vol 256 (6566) pp 725, 727, 729 (June 23)

A wagon mounted drifter was shown as a CP-55 diamond drill, complete with core barrel and examples of cores, amongst other drilling equipment exhibited. 9 illustr. *D* *Nh.27*

USP 2,950,087 (Oct 24, 1955) **J. N. Gregory**
Combined rotary and percussion drilling

This combination permits drilling through an unconsolidated formation by means of a percussion bit while eliminating the danger that the bit will be lost if the bore hole caves in. The tubular part of the rotary drill ends in a rotary shoe coated with abrasive hard material. Inside the tube operates a fluid actuated percussion drill which is reciprocated vertically. The percussion bit is maintained concentrally within the lowermost section of the casing string by a conventional centralizer. 6 claims, 7 illustr. Ref cited : 9 USP.
J *Cfbf Pr.545/Cfbr Pr.545*

FP 1,228,941 (Mar 17, 1959) **W. Tiraspolsky**
Tool for earth drilling. Outil pour le forage du sol

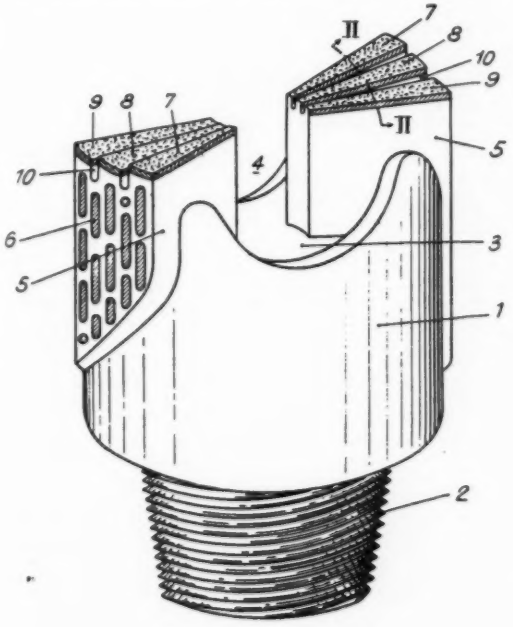


Fig 3. FP 1,228,941.

The tool shown in Fig 3 is characterised by radial cutting edges in stepped arrangement so that the bottom of the hole is first attached by edges 7. When these edges are worn edges 8, finally edges 9 come into play. The cutting material may be diamond. The diamond particles may be distributed as in Fig 4 or as in Fig 5 with decreasing thickness of the cutting portions from 14 to 16. 12 claims, 8 illustr.
J *Bnz Cfb Pl.545*

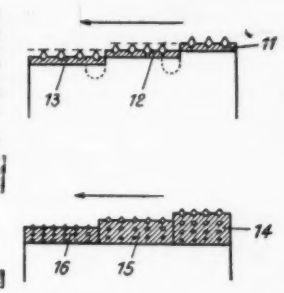


Fig 4 (top) and 5 (bottom). USP 2,942,387.

DAS 1,087,545 (June 5, 1959) **K. Jahns, Hamborner Bergbau AG**
Double core tube for core drilling. Doppelkernrohr für Kernbohrungen

The inner core tube is so supported in the double core tube that it is not turned by the rotation of the drill and thus damages the core. This in previous designs often occurred by friction between the tubes. The rotation of the inner tube is prevented by connecting the tube with levers spread out by spring pressure, or the flow of the drilling fluid, so that the levers are pressed against the wall of the hole while the outer core tube, carrying the diamond drilling crown, is free to rotate the connection of the inner core tube, the levers being provided by a gear mechanism. 7 claims, 2 illustr.
J *Bn Cfb Plb.545*

WIRE DRAWING

The fundamentals of wire-drawing. 12—The drawing of fine wire on slip-machines

C. P. Bernhoeft. *Wire Ind* 1961 Vol 28 (330) pp 591-592 (June)

Points out that there is a very great difference in wear between tungsten carbide and diamond dies, therefore diamond should always be used when drawing fine wire. A method is given for evaluating what die angle should be used in diamonds having such small bores. 1 illustr, 4 tables. *D* *Cn Nkb*Cn Pxb Rhb*

Hot extrusion

R. Cox. *The Prod Engr* 1961 Vol 40 (6) pp 401-414 (June)

Experience gained in the hot extrusion of titanium, zirconium and cobalt base alloys is described. Dies and die blanks must meet many requirements in this process, especially when difficult sections have to be produced and, it is stated, an ideal die material is still to be developed. 16 illustr, 2 ref.
D *An Bfx Cn Px*

" Universal dies "

V. V. Shevelev reviewed by L. P. Obozov. *Kuz-shtam proizv* 1961 Vol 3 (2) p 47 (Feb) ; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (1) p 172 (Apr)
E *Px*

Sintered tungsten carbide dies in the wire industry

E. T. Miller. *Wire and Wire Products* 1960 pp 1668-1670 and 1719 (Dec) ; *Pera Bull* 1961 Vol 14 (3) p 64 (Mar)

Describes the history and development of tungsten carbide dies. Discusses present design techniques and future trends. *D* *Pxb Rhb.21*

GRINDING AND POLISHING OF CARBIDES AND METALS

Bryant double-end internal grinder

Bryant Chucking Grinder Co, Springfield, Vt. *Machinery, NY* 1961 Vol 67 (10) p 165 (June)

The new Bryant machine is specifically designed for grinding both straight and tapered bore at a single chucking of the workpiece. Wheel dressing is automatically cycled. *W* *Chcn Pr Psf*

Different-sized parts lapped in multiple quantities

H. C. Gunetti. *Machinery, NY* 1961 Vol 67 (10) pp 113-117 (June)

Metal-finishing techniques, originally developed for servicing diesel-engine injectors and pumps, are now being applied to the manufacture of oil well pumping systems. The lapping technique permits articles of dissimilar weight and size to be lapped simultaneously; this is achieved by loading all parts so that they bear on the lapping plate with the weight of the heaviest component. Lapping plates and compounds can be changed to suit the work material. Lapping pastes have been proved superior to oil types. Diamond, Norbide and aluminium oxide abrasives are used, according to the material being lapped and the surface finish required. Plates for lapping carbon seal rings, for example, are charged with 3 micron diamond dust. Automatic finishing within 0.000005 in. is possible with this system. 6 illustr.
W *Chd Nv.1456/Chd Pg.1456*

Making components for type casting and composing machines

P. A. Sidders. *Machinery, Lond* 1961 Vol 98 (2536) pp 1392-1401 (June 21)

Tungsten carbide cutting edges of a horizontal milling machine used for notch milling are finished by lapping with a diamond wheel. Article describes methods and equipment employed by the Monotype Corp Ltd, Surrey. 15 illustr.
D *Cff Pr:Al Bkcb Chb Nv*

Chinese machine tools at the Leipzig Fair

R. E. Green. *Machinery, Lond* 1961 Vol 98 (2536) pp 1415-1423 (June 21)

Tools described include a cylindrical grinding machine, an automatic internal grinding machine with diamond dresser attachment, a centreless grinder with hydraulically operated dressing unit, an optical profile grinder and an automatic gear grinding machine. 12 illustr.
D *Chcl Pr.372:.27.322/Chcn Prs:Nj Psf.372:.27.322*

Grind away cutting costs

L. P. Tarasov. *Amer Mach* 1961 Vol 105 (11) pp 58-59 (May 29)

A case is made out for abrasive machining which, it is claimed, is often the most economical method for machining a part. 1 illustr, 1 table.
E *Az Chc Rd*

Bore honing to within 0.000,020 in.

Barden Corp. *Amer Mach* 1961 Vol 105 (11) p 76 (May 29)

This machine uses a gimbaled workholder for the inner ring to permit honing, it is claimed, to within 0.000,020 in. tolerance and near perfect roundness, yet maintains squareness of bore to ring. The finished precision bearing has 14 critical dimensions held within tolerances of 0.000,020 inch. 1 illustr.
E *Az Chh Pr*

Frauenthal contour grinding machine

Frauenthal Division of Kayden Engineering Corp, Mich. *Mach Shop Mag* 1961 Vol 22 (6) pp 357-358 (June)

This machine, developed for the precision grinding of nose-cones, is staged to be able to reproduce the shape of the master to within ±0.0005 inch. The tracer unit may be replaced by a second grinding wheel where operation from a master is not required.
B *Chch Pr*

Feinprüf surface grinding machine

Henry Pels & Co Ltd, 32-38 Osnaburgh St NW 1. *Mach Shop Mag* 1961 Vol 22 (6) p 355 (June)

The Feinprüf model Tricurat 60 precision surface grinding machine has maximum travel of 16 in., and the length of travel can be limited accurately to 0.0005 in. Fine-feed adjustments to 0.00005 in. may be obtained using push-button controls both for table-cross traverse and for vertical travel. To assist accurate setting, built-in comparators are incorporated reading to 0.00005 inch. 1 illustr. *B* *Chcm Pr*

Grinding crowned spherical coupling teeth

Michigan Tool Co. *Mach Shop Mag* 1961 Vol 22 (6) p 364 (June)

This can be done automatically on an external form grinder developed by the Michigan Tool Co. The coupling units are said to be held to within 0.0004 in. on the involute tooth form, within 0.0002 in. on pitch and with a maximum spacing error of 0.0006 inch.
B *Az Chc Pr*

Cam shaper makes sharp radii not possible on milling cutter

Hudson Automatic Machine & Tool Co, 137 38th St. Union City, NJ. *Amer Mach* 1961 Vol 105 (10) p 170 (May 15)

The Doebeli carbide tool grinder, made for grinding and lapping cutting tools, has diamond wheels for grinding and lapping mounted side by side on the same shaft. 1 illustr.
D *Al Bk Chc Nv Pr/Al Bk Chd Nv*

Precision profile grinding of split die blocks

O. Loeffler. *Amer Mach* 1961 Vol 105 (10) pp 134-137 (May 15)

With the set-up described a surface finish of about 80 micro-inches and dimensions with 0.0005 in. can, it is claimed, be achieved. Though not a new technique this combination of mechanics and optics is said to eliminate the main inherent disadvantage of more commonly used methods, the fact that the operator's attention is not on the workpiece. For grinding high carbon high chrome steel an aluminium oxide wheel was used and with a different wheel carbide die blocks are said to have been ground. 9 illustr.
D *Axz Chch Pr/Bhbz Chc Pe Rnbz*

Crown gear grinder also grinds spurs, splines

Gear Grinding Div, Michigan Tool Co, Detroit. *Canad Mach* 1961 Vol 72 (5) p 97 (May)

This firm announces Model CGG-16 × 18 FA crown gear grinder which may also be used to grind spur gears and splines as well as to ease off near the end of spur teeth. The wheel is automatically dressed to the proper form and compensation for wheel wear is available. Grinders may be preset for completely automatic cycle of roughing, semi-finishing and finish-grinding gears to 10 in. OD or may be operated in semi-automatic or manual cycle. Because of the oscillating drive used when crown grinding, the crown radius is not affected by the diameter of the grinding wheel. 1 illustr.
K *Adz Chc Pr*

Surface grinder fixture for milling cutters

C. Spicer. *Canad Mach* 1961 Vol 72 (5) p 87 (May)

Describes equipment for mounting on a surface grinder, and which is claimed to be of special interest for shops with limited equipment for grinding milling cutters. 1 illustr.

K *Alc Chcm Psc*

Grinding attachment, for surface grinding odd corners

Speedline Sales Co. *Canad Mach* 1961 Vol 72 (6) p 102 (June)

To assist surface grinding in hard-to-reach areas, the Diamond Speedgrind is quickly and easily attached to most surface grinders. Slipless belt tension adjustment eliminates strain on bearings; shaft runs in lifetime-lubricated super-precision ball bearings. 1 illustr.

K *Chcm Nv Pr Psc*

Internal grinding machine for straight or taper bores

Bryant Chucking Grinder Co. *Canad Mach* 1961 Vol 72 (6) p 99 (June)

Description of a new double-end internal grinder for concentric, accurate and desired finish of work such as diesel nozzles. The machine will grind both straight and tapered bores at a single chucking; two opposed wheel slides and a rotary indexing worktable permit two parts to be ground simultaneously. Machine cycle is completely automatic, including wheel dress cycling. 1 illustr.

K *Az Chcn Pr*

The effect of grinding wheel wear on the accuracy of a ground gear wheel

A. V. Machitidze. *Machines & Tooling* 1960 Vol 31 (12) pp 14-16 (Dec) (Original in Russian)

Describes results of investigations which make it possible to determine error in tooth grinding arising from wear of the grinding wheel. It is concluded that either automatic compensation mechanisms for wheel wear should be used, as wear is very considerable when gears with large numbers of teeth and of great width have to be ground, or devices ensuring (after dressing on completing a predetermined number of teeth) the preservation of the initial position of the cutting edges of the tool relative to the overall depth of the teeth. It is also suggested that harder grinding wheels be used to ensure greater accuracy. 9 illustr.

D *Abmb Unr.21*

Cutter grinders and engraving machines

Antares Instruments Inc, Woodside 77 NY. *Mod Mach Shop* 1961 Vol 33 (12) pp 281-282 (May)

The Kuhlmann cutter and tool grinder, Model FSM, which is equipped with helical and radial grinding attachments, can handle the re-sharpening and restoration of almost all types of cutters and tools, it is claimed. The same company demonstrates the KSM bench type precision grinder for the shaprening of high speed steel and carbide tools. 1 illustr.

B *Al Chc Pr Psc/Al Chcw Pr*

Bench miller and grinder

Automatic Mill Inc, Danbury Industrial Park, Danbury, Conn. *Mod Mach Shop* 1961 Vol 33 (12) p 293 (May)

The Automatic Mill is designed to deal with a wide range of parts in a continuous process at 250-6000 machined parts/hr, within tolerances of ±0.00025 inch. 1 illustr.

B *Cff Prs*

Straightening grinding wheels

S. K. Zarais'kyi, D. H. Kremins'kyi, Mekhsil' hosp 1961 Vol 12 p 25 (Jan); *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (1) p 134 (Apr)

E *Ab Cg*

Honing lap cuts like diamonds

Newtools Inc. *Mach Tool Blue Bk* 1961 Vol 56 (6) p 260 (June)

This tool is claimed to cut like diamond, and yet cost 70% less than diamond. Four grits are available: 180 for roughing, 220 for standard finishing, 360 for fine finishing, and 500 for superfine work.

K *Ceg Nv*Ceg Pg*

Honing tool with expansion bar

Allied Machine & Engr Co. *Mach Tool Blue Bk* 1961 Vol 56 (6) pp 246-247 (June)

This tool employs an expansion bar in place of the conventional stone holder and expansion pins, and has reversible wear plates, a feature that is said to increase the life of the tool by 100 per cent. 1 illustr.

K *Chh Pgk Uqe*

Diamond machining of carbide components of dies on surface and cylindrical grinding machines

A. E. Gel'fand. *Machines & Tooling* 1960 Vol 31 (12) pp 7-11 (Dec) (Original in Russian)

The best type of carbide for making cutting components of punching dies is said to be the tungsten-cobalt alloy type VK 20. Surface finishing of carbide has similarly been found to be effected most efficiently using diamond impregnated grinding wheels. For establishing the most useful characteristics of diamond wheels, and procedure of diamond grinding of type VK 20 carbides, the Diamond Scientific Research Institute conducted experiments on surface and cylindrical grinding machines. A description of the tests conducted and conclusions arrived at follows, and amongst the latter, it is stated that the ideal characteristics of diamond wheels for this process are granularity of 180 and diamond concentration of 50% with a powdered bakelite binder. 7 illustr.

D *Bk Chm Nv.21*

This barrel spins and vibrates

A. A. Polucha. *Metalworking Prod* 1961 Vol 105 (27) p 83 (July 5)

The article sets out the fundamentals of vibratory finishing, desribes the horizontal and spring-mounted barrel, and the tub-shaped container types, and goes on to describe the recently-developed Sweco Vibro-Energy finishing mill. 1 illustr.

B *Chmz Pr Qn*

Dressing grinding wheels with diamond and diamond-substitute tools

A. F. Nesmelova. *Book Moskva, Gos nauchno-tekhn izd-vo mashinostroit* 1960 101 pp; *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (1) p 103 (Apr)

E *Ab Cg Nj/Ab Cg Pf*

Sharpening cutters and other multiblade tools with grinding devices

K. Z. Korshevets. *Trudy Kuban sel'khoz inst* 1958 (6) pp 107-116 *Library of Congress Mthly Index Russ Access* 1961 Vol 14 (1) p 100 (Apr)

E *Al Chc Psc*

Man-made diamond in Elgin lapping compound

Elgin National Watch Co. *Wire & Wire Prod* 1961 Vol 36 (5) p 644 (May)

GEC's Man-Made diamond is available commercially in grinding wheels, micronized powder, and now in compound, Elgin Dymo-D. This has been specifically developed for lapping diamond dies.

D *Kmf/Nk:Chd Kmg/Nvh*

Precision lapping

Payne Products International Ltd, Buckingham Ave, Slough Trading Estate, Bucks. *Mech World* 1961 Vol 141 (3503) p 218 (June)

A millionth of an inch surface flatness can be obtained using a Lapmaster, it is claimed, on such materials as ceramics, plastics and carbides. There are six models in the range.

D *Bk Chd Pr/Bl Chd Pr/Bp Chd Pr*

Lapping and grinding

Engis Ltd. *Wire Ind* 1961 Vol 28 (330) p 578 (June)

Hyprez diamond lapping compounds for precision lapping and minor finishing of plastic moulding tools, also for wire-drawing dies, were exhibited together with the new Hyplicator, an expendable metering device for dispensing diamond compound. Abracap shaped abrasive caps and sleeves for localised grinding of metals and plastics and internal and external expanding helical slot laps for precision lapping of all internal and external diameters were also shown. Another exhibit was of a slow speed lapping machine for precision flat lapping of all tool room components. 1 illustr.

D *Ax Chd Kmg/Az Bp Chd Kmg*

Electronic instrument monitors grinding wheels

B. O. Morris Ltd., affiliate of Harper Engineering & Electronics New York. *Prod Engng* 1961 Vol 32 (22) p 9 (May 29)

An electrostrictive transducer picks up the vibrations of a grinding wheel as it touches the work and converts them into electrical signals which are displayed on a cathode ray tube. It is claimed that the high frequency vibrations of the wheel are accepted and that the lower frequency vibrations caused by the bearings are rejected. Rythmic changes in the V-shaped signal reveal spring or eccentricity in the workpiece. 1 illustr.

E *Chc Pr Wp*

Interesting new developments in surface treatment technology at the Hanover Industries Fair 1960. Interessante Neuentwicklungen in der Oberflächenbehandlung auf der Industrie-Messe Hannover 1960

Anon. *Klepzig Fachberichte* 1960 Vol 68 (6) pp 201-207 (June) (In German)

Among new developments shown at the Fair are :— the abrasive sponges manufactured by Artifex Chem Fabrik, Dr Lohmann & Co, which are especially suitable for grinding hollow surfaces, and which can be obtained in any form, as insert or grinding wheel, and the new 'Schleifbold' segmented grinding wheel by Kemper-Kontakt—Gert Kemper which can obtain a high degree of surface finish on either flat or curved workpieces of ferrous or non-ferrous materials. 11 illustr.

K *Pez.27.322*

Contact band-grinding machine design. Kontakt-Bandschleif-maschinendanlage

Anon. *Industrieblatt* 1961 Vol 61 (6) p 412 (June) (In German)

The machine runs at variable speeds, anywhere between 6 and 18 metres/min, and can deal with bands up to 500 mm in width. 1 illustr.

B *Az Chc Pr*

Twist drill grinder for small drills. Spiralbohrerschleifmaschine für Kleinbohrer

Anon. *Industrieblatt* 1961 Vol 61 (6) p 413 (June) (In German)

This machine can grind twist drills from 0.3 to 15 mm, using a sapphire disk. It is claimed that the time needed to grind a drill is reduced to about 10 seconds. 1 illustr.

B *Albz Chc Pe Rjb:Pr*

Shank tap grinding fixture

R-O Mfg Co, Madison Heights, Mich. *Tooling & Prod* 1961 Vol 27 (2) p 58 (May)

A specialised tap grinding fixture simplifies the task of sharpening bent and hook shank taps. The new unit eliminates the need for removing nib-taps from the shank for flute grinding or relieving of chamfers.

W *Az Chc Psc*

Mechanical polishing

Burkart, Silman & Draper. *Met Ind, Lond* 1961 Vol 98 (17) p 339 (Apr 28)

Book, Robert Draper Ltd, 85 Udney Park Rd, Teddington, Middx. 267 pp. Price 60s.

Deals largely with the practical aspects of polishing although a brief introduction covers basic theory. Manual and automatic grinding and polishing, barrel finishing and abrasive blasting of metal, plastics, wood, lacquers, glass, horn and ivory are dealt with, the polishing of metals naturally taking pride of place. Comparison is made between mechanical, electro- and chemical polishing ; lapping, honing and super-finishing are considered.

[Not in library of Industrial Diamond Information Bureau]. *D* *Bf Chc.1456.52/Bm Chm.1456.52/Chd.1456.52/Chh.1456.52*

Grinding with magnetic fixed stay

Anon. *Tooling* 1961 Vol 15 (7) p 60 (July)

The application of fixed stays is general practice when grinding small workpieces between centres. Discusses a new fixed stay developed in Czechoslovakia, which solved the problem of using centre grinders for smaller workpieces by serving not only as a support, but also as a holder of the workpiece. 2 illustr.

K *Chc Pr Pscz*

Proper sharpening means longer tool life

W. H. Mcneilly. *Cutting Tool Engng* 1961 Vol 13 (5) pp 10-15 (May)

Advice on grinding a variety of cutting tools. Aluminium oxide is recommended for HSS tools, silicon carbide or diamond for carbide single-point tools. Diamond grinding wheels are required for carbide multi-toothed tools. 9 illustr. To be cont.

W *Al Bfcbd Chc Rj/Al Bk Chc Nv*

Saw sharpening machine

Colton & Co (Lapidaries) Ltd, The Crescent, Wimbledon, London SW 19. *Mach Lloyd* 1961 Vol 33 (11A) p 39 (June 3) ; *Mach Shop Mag* 1961 Vol 22 (6) p 364 (June)

A special electro-deposited diamond grinding wheel and lubricator can be supplied with this saw sharpening machine for topping and facing tungsten carbide tipped saws. Band saws up to 2 in. wide and circular saws from 4½ in. to 40 in. diameter may be sharpened, it is claimed. 1 illustr.

D *Alf Bkcb Chp Nv Pr*

The constitution of quaternary aluminium-copper-magnesium-silicon alloys at 500° C

D. P. Smith. *Metallurgia* 1961 Vol 63 (379) pp 223-231 (May)

The constitution of alloys that had been severely worked and then annealed at 500° C for 4 weeks, and which contained 0-2% silicon, 0-4% magnesium and 0-4.5% copper has been studied by microscopical examination. Specimens for examination were finished by turning on a lathe, then wet-ground on silicon carbide papers and finally polished using 0-2 μ diamond polishing compound, ordinary thin lubricating oil being used as a lubricant. 11 illustr, 4 tables, 12 ref.

D *Bfx Chm Kmg/Bfx Uc.21*

Swiss Trade Fair—Basle 1961. Schweizer Mustermesse Basel 1961

Anon. *Draht* 1961 Vol 12 (6) pp 276-279 (June) (In German)

Among exhibits mentioned is the RST 10 cutting off grinder produced by Gebr Rykart Maschinenfabrik, Aarburg. This machine, which is developed from an angle grinder may be used for iron, steel and cast iron, or using a suitable wheel, ceramics, porcelain and plastics. *K* *Cegc Pr.27.323*

Damage on gear wheels as a result of faulty machining and surface hardening. Schäden an Zahnrädern infolge fehlerhafter Bearbeitung und Oberflächenhärtung

Anon. *Maschine u Werkzeug* 1961 Vol 62 (13) p 18 (In German)

Examples of cracks and flaws in gear wheels are examined and means of eliminating them are suggested. Polishing the surface of hardened gear wheels leads to a considerable increase in fatigue strength for example. *K* *Ad Unr.21*

Surface grinder with automatic compensation for wear on the grinding wheel. Rectifieuse plane à rattrapage automatique de l'usure de la meule

Anon. *Techn Rundschau* 1960 (Dec 9); *La Pratique des Industries Mécaniques* 1961 Vol 47 (6) p XXIX (June) (In French, original in German)

At the Milan Fair the Italian firm Favretta showed surface grinders with an automatic feed device, and fitted with automatic compensation for wear on the grinding wheel. This is operated by means of a pneumatic device in which a constant jet of compressed air is projected against the periphery of the wheel. *K* *Chcm Pr.27.3225*

New chip-producing machine tools at the Leipzig Spring Fair 1961. Neue spanende Werkzeugmaschinen auf der Leipziger Frühjahrsmesse

B. Hopfe. *Werkstatt u Betrieb* 1961 Vol 94 (6) pp 351-356 (June) (In German)

Among machines shown were the VEB Schleifmaschinenwerk Karl-Marx-Stadt universal cylindrical grinder, which is now fitted with a new kind of measuring and control device. 20 illustr. *K* *Chcl Pr Wp.27.322*

Step and twist drill grinder. Stufen- und Spiralbohrer-Schleif-maschine

Rönshoff. *Industrie-Anzeiger* 1961 Vol 83 (53) p 1002 (July 4) (In German)

Step-angles between 180° and 90° with a maximum diameter of 33 mm may be ground on this machine, which is also suitable for standard twist drills with a diameter of between 3 and 23 mm. 1 illustr. *K* *Alb Chc Pr*

Balancing of grinding wheels. Das Auswuchten von Schleifscheiben

H. Schneider. *Klepzig Fachberichte* 1960 Vol 68 (6) pp 188-190 (June) (In German)

Correct balancing of the grinding wheel is necessary not only to ensure a good surface finish but also to avoid wear on the spindle bearings. Various devices are discussed and illustrated. 6 illustr. *K* *Pe Psc Qq*

LITERATURE REQUESTS
When applying for the loan of literature abstracted in this journal, please quote the title of the article, the name of the author, and the number of the page on which it appeared.

Tungsten carbide cutting tools. Les outils de coupe en carbure de tungstène

M. Pidet. *Mach-outil-franç* 1961 Vol 26 (166) pp 121, 123, 125, 127 (June) (In French)

Deals with the economic considerations of the use of tungsten carbide cutting tools with special reference to the condition of the machine. Correct regrinding is of great importance and impregnated diamond wheels are recommended for semi-finishing and super-finishing. 6 illustr, 1 table. To be continued. *K* *Chc Nq.21/Pdc.21*

BP 844,209 **Cincinnati Milling Machine Co** (Apr 14, 1958—USA)

Machine Tool mechanism for cross feeding in discrete amounts

In order to produce precise cross feeding between grinding wheel and the work (milling cutter) support in discrete amounts, which assure optimum stock removal and reduce wear of or damage to the expensive diamond wheel, the feed is produced by a pawl and ratchet mechanism, in which the pawl is reciprocated by a solenoid, energized through a foot operated switch. 5 claims, 8 illustr. *J* *Al Chc Nv Pr.545*

BP 864,760 **C. Klingspor** (Jan 18, 1958—Austria)

Grinding wheel

Refers to a rotary abrasive member comprising a number of axially aligned tapered sectors of abrasive material fitted together to form a helical body having a peripheral working face following a helical path. The sectors are mounted between ring sectors which complement to form a helical body carried by a shaft. 4 claims. *H* *Pe Qc.545*

USP 2,942,387 (Mar 3, 1958) **F. W. Lindblad**

Cup-shaped diamond grinding wheel

Fig 6 and 7 illustrate one embodiment in which a core 1 holds a diamond ring 2 so that this ring is located on the inner side of the cup-shaped core on a radially extending shoulder 8 terminating in a thin rim

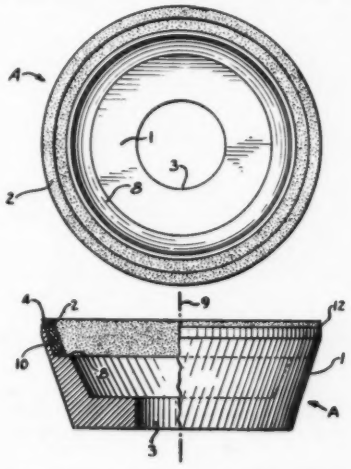


Fig 6 (top) and 7 (bottom). USP 2,942,387.

portion 10, 12. The core may be of plastics (nylon) and the resin-bonded diamond ring may be fixed to the core by an epoxy resin bond. 10 claims, 4 illustr. Ref cited: 3 USP: see also: USP 2,703,437. *J* *Nvf.545*

BP 864,651 Commonwealth Scientific and Industrial Research Organization
(Oct 30, 1958—Australia)

Hypodermic or like needle sharpening apparatus

A hypodermic needle is formed with a point by producing on one end a flat or curved bevel surface oblique to the needle axis. When resharpening needles it is important that the form and angle of the original bevel angle is reproduced accurately. This is achieved by lapping the surface on a metal lap in which abrasive powder is embedded. The apparatus illustrated is for producing flat bevel surfaces and consists of a rotating cast iron or bronze lap disk 10 on which is supported by tungsten carbide underflat 18 a spring pressed block

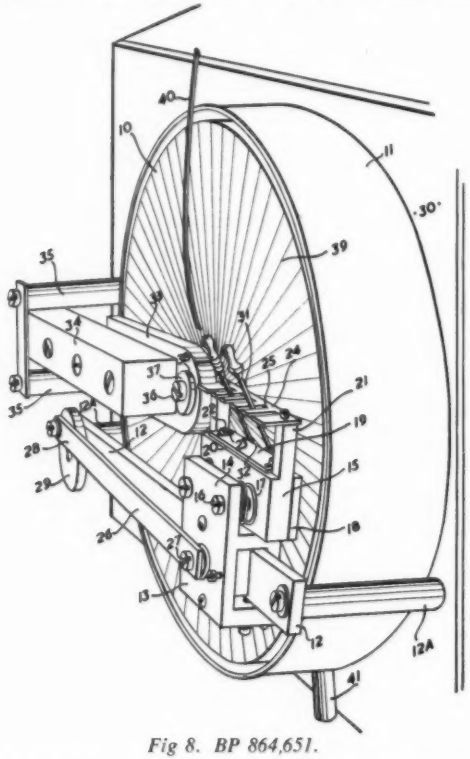


Fig 8. BP 864,651.

15 reciprocated along a quick bar 12 by a connecting rod 26 and crank 29. The disk and block assembly is supported on a table 30 at an angle to the vertical approximately equal to the angle between the required bevel plane and the needle axis. Needles 31 are vertically inserted in a comb plate 34 so that their ends are received between the surface of the disk 10 and the edge 32 of a bar 19 carried by the block 15. A suspension of abrasive powder fed on to the disk is pressed into the surface thereof by a plate 33 reciprocated on the surface. For poducing cylindrical bevel surfaces a horizontal cylindrical lap is employed. 21 claims, 1 illustr.

H *Agz Chc Rd.545*

REQUESTS FROM AMERICA
American readers who wish to order a photostat or reprint of an article abstracted in Industrial Diamond Abstracts are advised to apply directly to the appropriate journal if this is an American publication.

BP 864,741 Lavallee & Ide Inc
(Sep 15, 1958—USA)

Reamer manufacture

In the manufacture of precision machinery and mechanisms reamers capable of holding extremely close tolerances are required. By grinding the operative positions of both the shank and flute ends of a reamer blank to a desired final diameter before the flutes are formed, it is possible to obtain absolute concentricity which in turn enables tolerances of reamed holes to be held to +0.0002 in. or less. The present method, which lends itself to mass production of reamers at a minimum cost, consists in centreless grinding of a hardened reamer blank from end to end to a desired final diameter and then grinding and sharpening flutes in one end of the reamer, leaving narrow lengthwise lands of the centreless ground diameter untouched so that the cutting diameter of the flute end remains absolutely concentric with the shank end. 4 claims, 7 illustr. *H* *Ald Chcc.545/Pdz Qc.545*

MACHINING PROCESSES AND DEVELOPMENTS

What's so different about high speed machining ?

Anon. *Mach Tool Blue Bk* 1961 Vol 56 (6) pp 112-115 (June)

3 illustr. *K* *Ceqz Pr.21*

Ultrasonic machining

L. C. Miller. *Mach Tool Blue Bk* 1961 Vol 56 (6) pp 116-119 (June)

Briefly discusses the range of applications and the materials used, and outlines the technical aspect of the process. Ultrasonic machining, however, is not competitive with other techniques and its main value lies in its ability to do work that cannot be achieved in any other way. In general it is safe to point out that when and if an operation can be practically and economically performed on conventional metal working equipment, ultrasonic machining should not be considered although there is some overlap. 4 illustr.

K *Ceqr.21*

Hammond electrolytic grinders built for tough machining

Hammond Machinery Builders Inc, 1618 Douglas Ave, Kalamazoo, Mich. *Amer Mach* 1961 Vol 105 (10) p 166 (May 15)

Steel and superalloy parts, as well as carbide tools, can be ground on two new additions (Models EGD-12 and 14) to the Hammond line of oscillating electrolytic grinders. Grinding that is burrless and free from metallurgical damage is claimed. 1 illustr.

D *Al Bk Chcr Pr/Az Bfcb Chcr Pr/Az Bfxz Chcr Pr*

Conversion to electrolytic grinding

Hi-Carb Corp. *Metal Progr* 1961 79 (6) p 23 (June)

The Hi-Cut power converter, which is available in five standard capacities from 250 to 1500 amp, enables any conventional grinder to be converted to electrolytic operation. It is claimed that grinding speed can be increased from 3 to 10 times and wheel costs reduced by as much as 90%, while superalloys, refractory metals, and honeycomb sections can be ground without producing burrs or annealed spots. 1 illustr.

K *Bfxz Chcr Pr/Bfz Chcr Pr*

Technique for the rapid, accurate and strain-free machining of metallic singie crystals

M. Cole, I. A. Bucklow, C. W. B. Grigson. *Brit J appl Phys* 1961 Vol 12 (6) pp 296-297 (June)

Spark planing, a new spark erosion method for the production of flat smooth metal surfaces, is described and its application to single metal crystals and to metallographic preparation is illustrated. The technique is said to be rapid, accurate and causes very much less damage to the surface than the most careful grinding operation. 4 illustr, 2 ref.

D *Bdz Ceqmbz.1356*

Electrolytic-mechanical polishing of iron-carbon alloys. Electrolytisch-mechanisches Polieren von Eisen-Kohlenstoff-Legierungen

J. Just, W. Altgeld. *Zeits Metallkunde* 1961 Vol 52 (6) pp 410-413 (June) (In German)

9 illustr, 1 table. *K* *Bfxf Chmkz*

High temperature machining solves space-age metal-cutting problems

W. Pentland, J. L. Wennberg, C. L. Mehl. *Tool & Mfg Engr* 1960 pp 92-98; *Pera Bull* 1961 Vol 14 (2) p 39 (Feb)

Describes the experimental machining of hard steels at high temperatures. *X* *Bfcbz Ceq.21*

Ultrasonic boost metal finishing

P. W. Sherwood. *Carbide Engng* 1960 pp 18-19, 26 (Sep): *Pera Bull* 1961 Vol 14 (2) p 46 (Feb)

Discusses application of ultrasonics to surface finishing. *X* *Bf Chm Vwghb.1451*

High production electro-erosion

La Soudure Electrique Languepin. Brit Rep: Solar Weld Languepin, Burnley, Lancs. *Metalworking Prod* 1961 Vol 105 (25) pp 65-67 (June 21)

Hardened springs are chamfered internally and externally at both ends at rates of up to 1,800/hr by electro-erosion at the Renault works in France. The special machine designed for the purpose, developed by Renault in collaboration with La Soudure Electrique Languepin, is described and the process outlined. 5 illustr. *D* *Az Ceqn Pr*

Keen competition for new cutting system

Anon. *Metalworking Prod* 1961 Vol 105 (22) p 9 (May 31)

Large scale commercial developments in electro-chemical machining are forecast now that a leap in cutting speed has been accomplished and, it is stated, the technique now needs time to mature.

D *Ceqp Pr.132*

Ultrasonics boosts grinding efficiency

J. Peacock. *Metalworking Prod* 1961 Vol 105 (26) p 60 (June 28)

Ultrasonic vibration of the coolant used in grinders, at frequencies that produced cavitation in the fluid, has been found to prevent loading, extend wheel life, and improve surface finish from 2 to 4 times. This attachment, developed by Cavitron Equipment Corp, USA, is also said to make 'sticky' material, such as brass and aluminium, easier to grind. 2 illustr.

K *Chc Pr Sj:Qnf*

Ultrasonic vibration paves way to greater design freedom

Anon. *Iron Age* 1960 pp 112-114 (Dec); *Pera Bull* 1961 Vol 14 (3) p 68 (Mar)

Discusses the advantages and limitations of chemical milling. 5 illustr in original.

D *Cffl Qnf.21*

Spark-erosion machine

Adam Machine Equipment Ltd, St Peters St, St Albans, Herts. *Tooling* 1961 Vol 15 (6) p 76 (June)

Working tolerances of ±0.0004 in. are stated to be possible with this machine, with a surface finish of 10 micro-in. and maximum material removal rate of 0.028 cu in/minute. 1 illustr.

D *Ceqmb Pr.21*

Machining thermal-resistant high-strength materials. Pt 2—Electrolytic machining

Anon. *Western Machinery & Steel World* 1960 pp 32-35 (Dec); *Pera Bull* 1961 Vol 14 (3) p 68 (Mar)

Discusses the applications of electrolytic machining on converted surface grinders and skin millers. 9 illustr in original. *D* *Chcm Pr:Ceqh.1451*

Electrolytic polishing and trimming. Elektrolytisches Polieren und Entgraten

Anon. *Maschine u Werkzeug* 1961 Vol 62 (8) p 152 (Apr 9) (In German)

The article descibes the process and the advantages of eelctrolytic polishing, and goes on to describe the 'Poligrat' equipment. *B* *Chmk Pr*

Deburring and cleaning midget components

Anon. *Mach Shop Mag* 1961 Vol 22 (6) pp 322-323 (June)

Electronic Mechanics Inc are now using an Airbrasive tool for cleaning and deburring midget guided-missile-components. It is claimed of this machine that it will cut shapes out of tungsten sheet only 0.005 in. thick and wire-strip potentiometers six to ten times faster and much more accurately. It will cut intricate patterns and shapes in silicon semi-conductor wafers. A minimum cut of 0.008 in. or narrower can be made, or it can abrade an area as large as several square inches. It uses five types of powder, aluminium oxide from 27 to 10 micron, calcium magnesium carbonate, and sodium bicarbonate. 2 illustr.

B *Az Ceq Pr Rdh*

The hot machining of metals

R. C. Brewer. *Engrs' Dig* 1961 Vol 22 (6) pp 83-87 (June)

Even super-carbides and ceramics have low tool life when machining high-strength, high temperature alloys requiring tools with greater toughness. One approach to this problem is that of hot machining where the temperature of the workpiece is raised up to 1200° F in order to reduce the shear strength of the material. The work of other investigators in this field is discussed together with more recent research work. It is not claimed that hot machining is a panacea for all the troubles of high temperature alloys, however it affords a considerable reduction in machining power and an increase in tool life varying by a factor from 5 to 100. A good surface finish can be obtained but the method is limited to roughing operations due to the difficulty of controlling the expansion and construction of the workpiece. 5 illustr, 11 ref.

F *Bfxz Ceq Pdc Uqe Vbb*

BP 844,011 **La Soudure Electrique Languepin SA** (Aug 7, 1957; July 25, 1958—France)

Improvements in or relating to electric spark erosion apparatus

9 claims, 7 illustr. *M* *Ceqm Pt.545*

REQUESTS FROM AMERICA

American readers who wish to order a photostat or reprint of an article abstracted in Industrial Diamond Abstracts are advised to apply directly to the appropriate journal if this is an American publication.

BP 843,348 **Vyskumny ustav pre Mechanizaciu a Automatizaciu**

(Mar 8, 1956—Czechoslovakia)

Apparatus for electro-erosive working of metals

Metals of considerable hardness present certain difficulties for electro-erosive working as the maximum charging current is limited for a certain capacity of the condenser. Any increase in the charging current leads to arcing or short circuiting. Furthermore a remarkable decrease in the number of particles removed has been observed when the charging current exceeds a certain value. Large capacity condensers produce greater electrode wear and rough workpiece surfaces. The difficulties have been overcome by using a high frequency current generator in which the exciting and working coils are located on the stator the rotor having no winding but being provided with slots or teeth around the circumference. 5 claims, 1 illustr.

J *Bf Ceqn Pt.545*

BP 862,953 **Firth, Sterling Inc**

(June 8, 1956—USA)

Control for spark machining apparatus

It is important to maintain the distance between the electrode tool and the workpiece at a constant value during spark machining. On the other hand, the distance is constantly changing because of metal removal or accumulation of removed particles between the tool and the workpiece. In the device illustrated in Fig 9 optimum spark gap is maintained by automatically controlling the distance between the tool and the workpiece. The apparatus comprises a spark energy source 44 for applying across the gap G between the

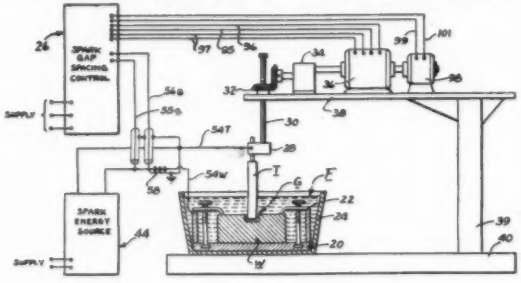


Fig 9. BP 862,953.

electrode tool T and the workpiece W, a series of time-spaced voltage pulses. The tool holder 28 is operatively coupled to an electric motor 38 through a feed screw 30, a nut 32 and a transmission 34. The speed and direction of rotation of the motor is controlled by electronic means 26 which provide to the motor an input voltage derived from the combination of the mean voltage appearing across the gap and a voltage which is directly proportional to the mean current flow in the gap. 9 claims, 10 illustr.

H *Ceqm Pr W p.545*

BP 863,649 (May 13, 1958) **Wickman, Ltd**

Improvements in electro-erosion machines

Means are provided for supporting and locating the workpiece and for supporting and positioning the electrode relative to the workpiece in order to facilitate inspection loading and unloading of the workpiece and of the work-table and the inspection, installation, and replacement of the electrode. As shown in Fig 10, the workpiece 18 is supported on a worktable 14 accurately located in a tank 10 by adjustable supports such as 11, 13. A carriage, comprising side members 22 connected by bars 23, 24, the bar 23 being rotatable in the

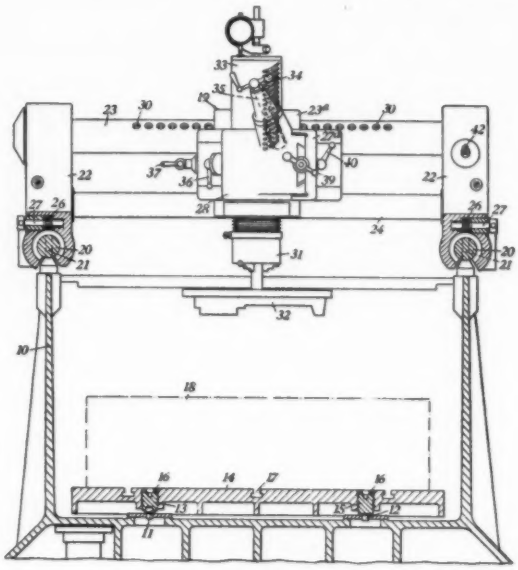


Fig 10. BP 863,649.

members 22, is slidably mounted on rails 20 extending along the sides of the tank 10. A bracket 23a, slidable on and angularly secured to the bar 23 carries an electrode holder 31 to which is secured the electrode 32. Vertical adjustment of the electrode relative to the workpiece is provided by means of a rack 34 and spindle 35. Inspection or removal of the electrode is obtained by pivoting the electrode about a horizontal axis on rotation of the bar 23 by a spindle and worm arrangement. 4 claims, 2 illustr.

H *Ceqn Pr.545*

USP 2,951,142 **W. Ullmann, Agie AG für industrielle Elektronik**

(Mar 19, 1956—Switzerland)

Method and arrangement for spark erosion by alternating current

A half cycle of the alternating voltage applied to the spark gap is at least partly suppressed for altering the voltage course and thus the gap configuration. This is obtained by bridging electrode and workpiece *eg* reversing polarity by a control member which has a variable forward resistance dependent on the direction of current. The voltage between tool and work may also be altered and thus vary the spark gap dependent on the magnitude of the voltage. Examples of workpieces produced by the method are shown in Fig 11, 12, and 13. The bore with a recessed end Fig 11 is obtained by first connecting electrode 7 with the positive pole,

Fig 11 (left), 12 (centre), and 13 (right). USP 2,951,142.

workpiece 8 with the negative pole. When the electrode has reached the shoulder polarity is reversed and a larger amount of material detached at the workpiece producing the widened blind end. 5 claims, 8 illustr.

Ref cited : 1 USP. *J* *Ceqmb.1456.54.*

FP 1,224,109 **SA Soudure Electrique Languepin** (Jan 5, 1959)

Method and devices for engraving continuous surfaces by electro-erosion. Procédé et dispositifs de gravure par électro-érosion de surfaces continués

Up to now it was necessary to employ a number of different electrodes *eg* for engraving names and dimensions on cylindrical rolls for metal rolling each having the shape of the letter or sign to be engraved. In the new method only one electrode is used. The shape of the electrode is such that electrode and workpiece surface can roll one upon the other but one of the two elements is supported for rolling movement only while the other one, the electrode, is subjected to

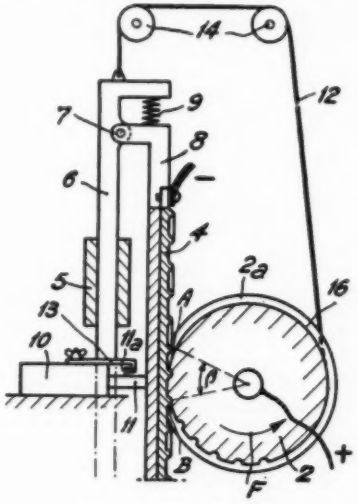


Fig 14. FP 1,224,109.

a certain force keeping the electrode at a desired distance from the workpiece surface. Fig 14 illustrates schematically the engraving of a roll for rolling steel bars for reinforced concrete. 2 is the roll connected through band 12 to electrode holder 6 with electrode 4 pivotable about 7, resiliently pressed downward by spring 9 and kept in its correct position towards roll 2 by 11a. 14 claims, 11 illustr.

J *Az Cpz.545*

PRODUCTION, GRADING & RECOVERY OF ABRASIVE PARTICLES

Durability of new cobalt or vanadium steel gear-wheel cutters

K. I. Kladova. *Machines & Tooling* 1960 Vol 31 (12) pp 32-33 (Dec) (Original in Russian)

Grinding of new types of steel most suited for use in gear wheel cutters is said to be very laborious using current abrasives, and it is suggested that for the wide use of a cutting tool made from these new steels, especially vanadium, production of corresponding abrasives for machining them should be arranged. 4 illustr. *D* *Chc Rd*Chc Rnh*

Hanover Trade Fair : Rotor-Polyflex polishing grinding wheels. Deutsche Industriemesse Hannover 1961 : Rotor-Polyflex-Polierschleifkörper

Anon. *Metalloberfläche* 1961 Vol 15 (7) p 219 (July) (In German)

The Rotor-Polyflex polishing grinding wheel consists of abrasive particles in an elastic bond, and is particularly suitable for the fine finishing of mouldings in the cutlery and steel industries.

B *Bfcb Chm Pe Urg*

Agglomerated abrasive products : a modern tool. VI—grain size. Les produits abrasifs agglomérés : outil moderne. VI—grosseur des grains

G. Winning. *Mach-outil franç* 1961 Vol 26 (166) pp 115, 117, 119 (June) (In French)

Provided that the material to be machined is of medium hardness, a large-grained wheel will give the same results as if it were softer, and vice versa. The softer and more malleable the material to be machined, the larger the grain-size which may be used, taking into account the surface finish required.

VII-hardness or grade. Surveys the hardness classifications, dealing with the influence of working speed, the material being machined, and the machine used. 1 illustr, 2 tables. To be continued.

K *Uu.2552*

TOOL PRODUCTION

Grinding sintered carbide tools and sintered carbide inserts. Das Schleifen von Hartmetallen und hartmetallbestückten Werkzeugen

G. Wicher. *Klepzig Fachberichte* 1960 Vol 68 (6) pp 179-184 (June) (In German)

Diamond grinding wheels have proved their worth in grinding sintered carbides as they combine relatively short working time with the high standard of surface finish required. The various bonds used for diamond grinding wheels are discussed, and it is upon this and the grain size and concentration that the wheel is chosen for a particular job. Synthetic diamonds are compared with natural diamonds and it has been found that while synthetic stones are preferable to natural diamonds for use in resin-bonded wheels, they do not stand up to the high pressures exerted on metal bonded wheels. Also gives details of type of machine to be used. 6 illustr. *K* *Al Bkc Chc Nv Ur/Nv Urb*Nvh Urb/Nv Urb/Nv Urc*Nvh Urc*

Metalworking report : cutting

Anon. *Amer Mach* 1961 Vol 105 (10) p 2 (May 15)

When bonded to steel tool shanks by a vacuum process, it is claimed that 75% of the industrial diamond tip may protrude. A 0.25 ct diamond tool is said to have been in good condition after fifty 0.001 in. deep passes across a 4 in. wide silicon wheel.

D *Cg Nj Psf Uqc*

Manufacture of grinding machines. Construction d'affûteuses

Anon. *Mach outil franç* 1961 Vol 26 (167) p 147 (July) (In French)

The Indian government-controlled company Praga Tools Corp, of Hyderabad, has signed an agreement with the British firm Jones & Shipman of Leicester allowing them to produce the latter's Model 310 tool grinder in India. *K* *Chc Pr Qc.371*

Investigation of the spark-hardening process for cutting tools

Anon. *Machinery, Lond* 1961 Vol 98 (2536) pp 1391, 1442 (June 21)

Unless certain precautions are taken, this method of forming a hard layer on the cutting tool face will not be made use of to the full. *D* *Pd.21*

BP 846,187 **Unimatic Mfg Inc**
(Aug 5, 1957—USA)

Abrasive tools and methods of making same

A uniform abrasive body having good thermal conductivity characteristics so that thin sections can be used without becoming distorted by heat and which is also self-lubricating to minimize friction is obtained by blending a carbonizable binder and a filler with abrasive grains, forming the mixture and baking the formed tool in an inert atmosphere to carbonize the binder. The binder may be (coal tar) pitch, the filler graphite blended at a temperature between 110 and 165° C., then pressed into shape at 10 to 30 tons/sq in. and baked at 475 to 2200° C. for 12 or more hours. The tool may be a honing stone containing *eg* diamond particles as the abrasive. The stones are characterized by a uniform " ratio of removal ". 34 claims, 5 illustr.
J *Nv Qc.545/Pe Qc.545*

USP 2,947,616 (Nov 12, 1957) **L. Coes, M. S. Champagne, Norton Co**

Grinding wheel structure

One of the objects is the manufacture of wheels which are electrically conductive with an ohmic resistance suitable for certain machine control operations. The wheel consists of abrasive grains bonded by a non-conductive vitrified bond leaving interconnecting pore spaces in the wheel. This wheel is made conductive by a continuous lining of vitreous carbon on the walls of the pore spaces, produced by heating the wheel to 450 to 1780° C in an oxygen free atmosphere of hydrocarbon vapour for dissociating the vapour and depositing the vitreous carbon. Vitreous carbon is a distinct allotropic form of carbon probably a transition form from graphite to diamond. 8 claims, 3 illustr. Ref cited : 5 USP.
J *Pe Qc.545*

USP 2,950,523 (May 15, 1956) **H. A. Frommelt, F. Aberlin, J. A. Bitterli, W. G. Hessler**

Cutting tool and method of making

This refers in particular to the mounting of hard cutting bits *eg* in rock drills and boring tools, shaping and cutting tools and also in picker fingers as used in the textile industry. Proper mounting of raw tungsten carbide bits in sintered condition which have rough uneven surfaces requires grinding with diamond wheels to produce clean surfaces before clamping or brazing them into position as the brittle nature of the bits causes surface irregularities to promote their fracture. This grinding operation adds to the cost of the tool and therefore it was thought necessary to resurface a worn tool by an expensive diamond grinding operation. The factor of vibration also enters into consideration because of vibrational fatigue and its influence on the accuracy of the work. All these disadvantages have been overcome by the use of a matrix for securing ceramic or natural mineral bits such as diamond without the need for preparatory measures such as grinding and removing surface irregularities so that the bit becomes cheap enough to be thrown away when worn. The matrix is a sintered powder ferrous metal matrix alloyed with copper by infiltration growth which under shrinkage compression locks cutting element and matrix in intimate binding engagement together. 9 claims, 33 illustr. Ref cited : 20 USP ; 1 BP.
J *Pd Qc Qt.545*

POWDER METALLURGY

High-strength carbides

Anon. *Metalworking Prod* 1961 Vol 105 (27) p 16 (July 5)

A new method of sintering the basic ingredients in conventional carbides had resulted in a material that has grades with a Rockwell A hardness of 91.2 to 93.0 and a transverse rupture strength from 225,000 to 325,000 lb/sq inch. The formation of this carbide is described. *B* *Bkc Cql*

Hanover Trade Fair 1961 : [Sintered carbide saw—and grinding blades]. Deutsche Industriemesse Hannover 1961

Anon. *Metalloberfläche* 1961 Vol 15 (7) p 219 (July) (In German)

'Emil Lux' showed a wide selection of saw- and grinding blades composed of particles of sintered carbide in a steel bond, which, it is claimed, have remarkable grinding capabilities and almost limitless life at constant sharpness, on account of the diamond-like hardness and the firm bond to the base.
B *Pc Rh Urc.27.322/Pez Rh Urc.27.322*

Cutter life increased by tool ' dampening '

Ferro Powdered Metals Inc, Salem, Ind. *Tooling & Prod* 1961 Vol 27 (2) p 47 (May)

Ferro Damp cutting tool holders are said to extend tool life by a factor of four or five. Made of copper-infiltrated powdered iron, the tools absorb vibrations which cause premature deterioration of conventional tools. *W* *Pd Psp Uqe*

Progress in powder metallurgy : Proceedings of the 16th Annual Meeting of the Metal Powder Industries Federation, Chicago, April 1960

Metal Powder Industries Federation. *Bull Brit-non-ferr Met Res Assoc* 1961 Vol 41 (383) pp 267-268 (June)

Book, MPIF, 60 East 42nd Street, New York 17. NY. 1960, 215 pp. Price $10.

[Not in library of Industrial Diamond Information Bureau]. *D* *Qt.52*

USP 2,950,524 (June 2, 1955) **H. A. Frommelt, F. Aberlin, J. A. Bitterli, W. G. Hessler**

Means for mounting cutter bits or blades

A powdered metal compact is used as a matrix for the cutting element in its raw state *ie* not prepared by an expensive grinding operation. The matrix holds the cutting element in place by the internal compressive force of its material which has a coefficient of thermal expansion sufficiently greater than that of the cutting element so as to shrink about the cutting element. The matrix may be pure iron powder of 100 to 325 mesh or finer. A small amount of carbon and about 7% copper may be present. Infiltration of copper is carried out at a temperature of 1100 to 1200° C so that the copper content will be about 20 per cent. 4 claims, 9 illustr. Ref cited : 12 USP.
J *Cff Pd Qc.545*

MISCELLANEOUS

Study of accuracy in automised machining. Untersuchung der Genauigkeit in der automatisierten Fertigung

J. Peklenik. *Industrie-Anzeiger* 1961 Vol 83 (53) pp 987-992 (July 4) (In German)

12 illustr, 11 ref. *K* *Ceq Prs.21*

More old machines than ever

Anon. *Amer Mach* 1961 Vol 105 (11) pp 55-57 (May 29)

A review of the growing obsolescence of machines in America's metalworking industry. Grinding, honing, and lapping machines have shown large increases in the per cent overages. 62% of metal cutting and 68% of metal forming machines are said to be overage. 4 tables.

E *Chc Pr.342/Chd Pr.342/Chh Pr.342*

What is of note at the Leipzig Technical Fair ? Que peut-on retenir de la Foire Technique de Leipzig du printemps 1961 ?

F. Courtaud. *Mach Mod* 1961 Vol 55 (628) pp 49-52 (July) (In French)

A short evaluation of the machine-tools of East Germany on display at Leipzig, with descriptions of the most noteworthy. Also on display were machines from the East-European countries. 29 illustr.

B *Pr.27.322*

Hanover Trade Fair : Trowal vibrators. Deutsche Industriemesse Hannover 1961 : Trowal-Vibratoren

Anon. *Metalloberfläche* 1961 Vol 15 (7) p 219 (July) (In German)

The firm of Carl Kurt Walther displayed what are claimed to be the largest and smallest vibrators hitherto produced. The Trowal-Vibrator Ta 1-480 has a capacity of 480 dm^3, and the Ta 1-32 has 4 containers, each of 8 dm^3 capacity. The latter is intended particularly for the precision engineering, optical, and watch industries.

B *Pr Qn.27.322*

What you should know about carbide-tipped saws, Part 3

A. R. Segal. *Carbide Engng* 1960 pp 22-23, 26 (Sep) ; *Pera Bull* 1961 Vol 14 (2) p 38 (Feb)

Deals with care and use of carbide-tipped saws.

X *Alf Bk.1451*

PATENT LISTS

BRITISH

The Official Journal (Patents) (3774) (June 14)

874,291 GENERAL ELECTRIC CO. Method of converting carbonaceous material to diamond.

874,250 CARBORUNDUM CO LTD. Diamond abrasive articles.

The Official Journal (Patents) (3775) (June 21)

874,602 ASSOCIATED ELECTRICAL INDUSTRIES LTD. Diffraction gratings.

UNITED STATES

Official Gazette 1961 Vol 766 (1-4) (May)

2,982,056 F. E. EDQVIST. Grinding machines.

2,982,057 R. C. STANHOPE, MICROMATIC HONE CORP. Spherical grinding machine and method.

2,982,058 B. C. MAITENAZ, SOCIÉTÉ DES LUNETIERS COTTET, POICHET, TAGNON & CIE. Cutting machine, in particular for spheroidal or toroidal surfaces.

2,982,060 C. KLINGSPOR. Grinding wheel.

2,982,062 W. C. JACKSON, W. E. RUEHMER, NORDBERG MFG CO. Method for grinding gyratory crusher wearing parts.

2,982,280 H. E. WAYLAND, R. E. SONNELAND, TY-SA-MAU MACHINE CO. Stone cutting apparatus.

2,982,281 J. H. WILLIS. Stone cutter.

2,982,842 J. C. TUSCHER. Method for automatically executing cutters and the like shaped parts of revolution through electric erosion.

2,983,086 T. J. LA CHAPULLE jun, PACIFIC SEMICONDUCTORS INC. Flanged lapping jig.

2,984,051 G. MONNET, F. M. HENNEQUIN, CIE DE SAINT GOBAIN. Apparatus for surfacing glass.

2,984,052 J. C. MUELLER jun, NORTON CO. Coated abrasives.

2,984,054 C. T. CROFT, DEWRANCE & CO LTD. Lapping machines.

2,984,158 E. WILDHABER. Method and means for cutting spiral teeth.

2,984,234 H. S. HALLEWELL. Forming means for profile grinding wheels.

2,984,555 F. L. CURTIS, NORTON CO. Mounted points.

2.984.951 W. C. COONS, W. McKIMM, D. W. PEASE, SNOW SHOE, CURTISS-WRIGHT CORP. Automatic polishing device for metallographic specimens.

2,984,953 N. D. NEAL, CINCINNATI MILLING MACHINE CO. Electrical gauging device.

2.985.050 B. G. SCHWACHA, NORTH AMERICAN AVIATION INC. Liquid cutting of hard materials.

2.985.163 H. S. HALLEWELL. Forming apparatus for profile grinding wheels.

SOUTH AFRICAN

Official Journal 1961 Vol 14 (19-22) (May)

61/320 R. A. BAUMGARTNER, H. M. CANFIELD, H. W. BUELL, CARBORUNDUM CO. Abrasive articles and method of making the same.

AUSTRALIAN

Official Journal 1961 Vol 31 (13-15) (Apr-May)

233,109 COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION. Needle sharpening apparatus.

233,184 NV PHILIPS' GLOEILAMPENFABRIEKEN. Semi-conductive body and device.

SWISS

Patentliste 1961 (6-9) (Mar-May)

353,188 A. ERNST. Apparatus for measuring the hardness of materials.

353,469 J. PFAU, ATELIERS DES CHARMILLES SA. Tool for electrolytic machining and method of manufacturing this tool.

353,825 W. ULLMANN, W. EHRLICH, AG FÜR INDUSTRIELLE ELEKTRONIK AGIE. Electro-erosive grinding machine.

354,262 R. E. REASON, TAYLOR, TAYLOR & HOBSON LTD. Apparatus for indicating irregularities in the surface of a workpiece.

FRENCH

Bulletin Officiel 1961 Vol 2 (21-25) (May-June)

1,262,290 G. K. BANNIKOV, G. G. BRUSKO, A. L. LIVCHITS, A. M. SIGAREV. Graphite containing material for tool-electrodes.

1,262,026 HYDROMÉCANIQUE ET TROTTEMENT SARL. Grinding machines.

1,262,205 A. M. MATTISON, MATTISON MACHINE WORKS. Grinding machines.

1,261,950 M. G. RITTER, CHRISTENSEN DIAMOND PRODUCTS CO. Drilling tools.

1,262,812 F. W. ARMYTAGE. Method and machine for finishing by abrasion profiled surfaces of various workpieces.

1,262,907 S. MESSERSCHMIDT. Polishing method for geometrically spherical balls.

75,271 TIRASPOLSKY. Tool for drilling earth.
1,220,864

1,263,235 SEITZ & CO. Non-rectilinear shock absorbing pivot of industrial sapphire or ruby.

1,264,161 P. M. DREILING, HI-LITE POLISHING MACHINE CO INC. Device and method for polishing articles.

1,264,226 E. LAVERDISSE, GLACERIES DE LA SAMBRE SA. Glass polishing tool.

1,264,399 ATELIERS DES CHARMILLES SA. Method of machining a metallic workpiece by electrolysis.

1,264,726 C. P. PORTERFIELD, R. W. DRUSHEL, FIRTH STERLING INC. Device for spark machining with increased frequency.

1,264,551 REGIE NATIONALE DES USINES RENAULT. Device for stopping a machine by a vibration detector, with reference to the predetermined adjustment of the duration of a machining operation.

GERMAN

Patentblatt 1961 Vol 81 (17-25) (Apr-June)

Applications Open to Public Inspection

1,105,364 E. B. ROXSTRÖM, SVENSKA DIAMANTBERGBORRNINGSAKTIEBOLAGET. Device for obtaining oriented cores.

1,105,399 J. MERCIER, E. GRUNERT, PÉCHINEY, CIE DE PRODUITS CHIMIQUES ET ELECTROMÉTALLURGIQUES. Method of making pure corundum.

DIAMOND TECHNOLOGY

First published 1942 as " Production Methods for Diamond and Gemstone." The second edition of this book by P. Grodzinski has been revised throughout and considerably enlarged. 840 pages, 486 illustrations, 94 tables, and indexes. From NAG Press Ltd., 226 Latymer Court, London W 6. 55s 0d, post free.

1,105,682 L. KRETSCHMER, H. KRETSCHMER. Extruded pivot bearing of synthetic material for watches and fine mechanical apparatus.

1,105,689 H. ALLEMANN. Drilling machine for drilling and countersinking small parts, in particular for parts of watches.

1,106,009 W. ULLMANN, W. EHRLICH, AGIE AG FÜR INDUSTRIELLE ELEKTRONIK. Electro-erosion electrode composed of electrode parts insulated from one another.

1,106,204 E. FOUQUET. Truing device for rotary grinding tools.

1,106,217 R. SASKE, VEB FEINMESS DRESDEN. Engraving pantograph.

1,106,431 F. SCHLEICH, D. HOFFMEISTER, CARL ZEISS. Method and device for working material by means of a beam of charged particles.

1,106,451 C. CLAESSENS. Drill for dentistry.

1,106,636 J. A. THOMAS jun, CARBORUNDUM CO. Abrasive body.

1,106,892 A. LOTZ, SIEMENS-SCHUCKERTWERKE AG. Method for cutting threads in metal parts by electro-erosion.

1,107,116 H. FERNANDEZ-MORAN. Method of grinding a cutting diamond and grinding machine therefor.

1,107,118 G. L. GROVE, CINCINNATI MILLING MACHINE CO. Feeding device, in particular for a centreless grinder.

1,107,553 H. ENGELBRECHT, WERKZEUGMASCHINENFABRIK ADOLF WALDRICH. Method for stopping the feed, in particular the quick feed movement of a rotary tool, *eg* of a grinding wheel.

1,107,852 R. J. DIXON, W. H. BATEMAN, FIRTH STERLING INC. Device for making holes in electrically conductive workpieces by spark erosion.

1,108,461 L. A. SAYCE, G. D. DEW, NATIONAL RESEARCH DEVELOPMENT CORP. Method for copying optical copies of diffraction gratings.

1,108,587 E. MÖLLE, ALUMINIUMWERKE NURNBERG GmbH. Device for machining bodies of revolution *eg* pistons of IC engines by grinding or the like.

1,108,641 D. W. RUDORFF. Diamond impregnated or diamonds containing tool, in particular boring crown for deep drilling, stone saw, truing tool, *etc* and method for its manufacture.

1,109,394 M. TERRY, ELECTRIC & MUSICAL INDUSTRIES LTD. Device for controlling the depth of cut in the grooves of sound records in dependence on surface irregularities.

AUSTRIAN

Patentblatt 1961 Vol 58 (4-6) (Apr-June)

215,193 D. SWAROVSKI & CO. Ornamental stone.

215,851 DYCKERHOFF & WIDMANN KG. Cement-bonded grindstone containing corundum.

216,261 BALZERS AG FÜR HOCHVAKUUMTECHNIK UND DUNNE SCHICHTEN. Method of making an artificial ornamental stone.

INDUSTRIAL DIAMOND INFORMATION BUREAU

Industrial Distributors (Sales) Ltd, 2 Charterhouse Street, London, EC 1.

LIST OF PUBLICATIONS, AUGUST, 1961

For information on industrial diamonds contact the Industrial Diamond Information Bureau. Backed by the Diamond Research Laboratory in Johannesburg (the largest laboratory in the world devoted to diamond technology), the Bureau offers information and advice without obligation. Please write to the above address.

***INDUSTRIAL DIAMOND ABSTRACTS:** issued monthly, from 1944 onwards, about 20 pp, 7⅞ x 9¼ in. Surveys technical, scientific, and patent literature.

***LIST OF PERIODICALS IN THE INDUSTRIAL DIAMOND INFORMATION BUREAU LIBRARY AT MAY 31, 1958:** Alphabetical, 8 pp, 7⅞ x 9¼ in. A list of periodicals available for loan from the Industrial Diamond Information Bureau Library. This does not replace *List of Periodicals* (above), which is a list of periodicals abstracted in *Industrial Diamond Abstracts*, many of which are not held by the library.

***IDR REPRINT SERVICE :** Classified, authors' index, subject index of groups, 12 pp, 7⅞ x 9¼ in., Sep 1958. (Reprints 1s each, post free).

***THE DIAMOND RESEARCH LABORATORY:** 16 pp, illustr. 11 x 9 in. Rev ed, 1956.

SELECTED BIBLIOGRAPHIES:

* **Truing of grinding wheels** (from 1910 to 1951). 39 pp, 7⅞ x 9¼ in. 3rd rev ed, Feb 1952.

* **Diamond as cutting tool for metals and non-metallic materials.** 24 pp, 7⅞ x 9¼ in. 2nd rev ed, Nov 1950. Name index, 1951.

Hardness and hardness testing (from 1937 to 1955). 118 pp, name index, subject index, 7⅞ x 9¼ in. 1955-56. Price 5s 6d.

DIAMOND TOOL PATENTS (Patent Monographs)

IA: Machining metals and non-metallic substances, by P. Grodzinski, W. Jacobsohn. 2nd rev ed, 55 pp, 7⅞ x 9¼ in. Apr 1949. Price 10s.

II, IIs: Diamond abrasive wheels, by P. Grodzinski. 74 pp, 4 tables, name index, 7⅞ x 9¼ in. Aug 1948/49. Price 13s 6d.

III, IIIs: Truing of grinding wheels, by W. Jacobsohn. 133 pp, 82 illustr, name index, 7⅞ x 9¼ in. Dec 1948/49. Price £1.

IV: Polishing of gem diamonds, by W. Jacobsohn. 40 pp, 83 illustr, 1 table, name index, 7⅞ x 9¼ in. December, 1950. Price 12s 6d.

THE PRINCIPLES AND DESIGN OF A NUCLEAR RADIATION COUNTER WHICH USES A DIAMOND AS ITS DETECTOR, by W. F. Cotty. 18 pp, illustr, 7⅞ x 9¼ in. Oct 1956. Price 2s 6d.

---

* *Publication free of charge.*

'HABIT'

way out in front!

HABIT DIAMOND TOOLING CO. LTD

LURGAN AVENUE LONDON W.6

Telephone : FULHAM 7944

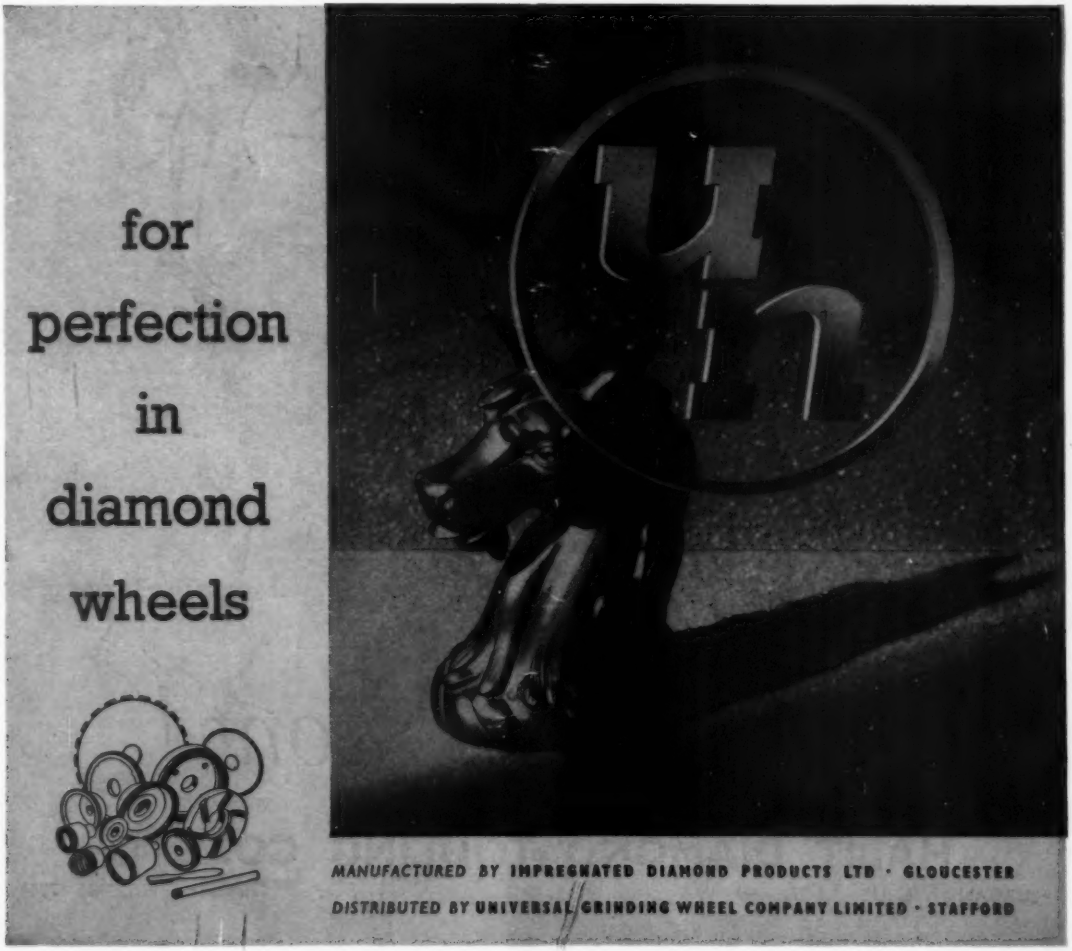
a journal for precision engineers and all users of industrial diamonds and other hard materials

INDUSTRIAL DIAMOND REVIEW

incorporating INDUSTRIAL DIAMOND ABSTRACTS

MONTHLY 1/3 SUBSCRIPTION 15/- A YEAR

August, 1961 Vol. 21 No. 249


for perfection in diamond wheels
MANUFACTURED BY IMPREGNATED DIAMOND PRODUCTS LTD · GLOUCESTER
DISTRIBUTED BY UNIVERSAL GRINDING WHEEL COMPANY LIMITED · STAFFORD